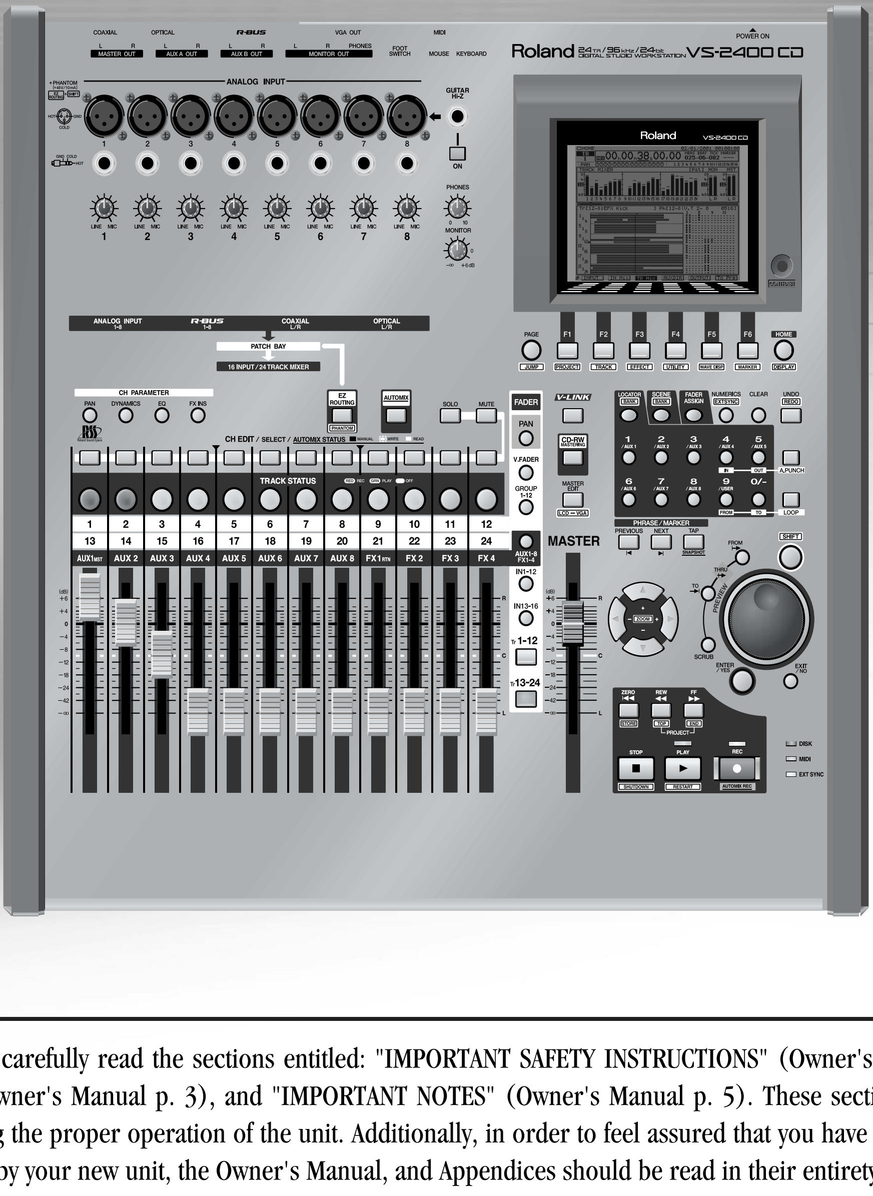
Owner's Manual

Roland

VS-2400CD

24TR / 96kHz / 24-bit

DIGITAL STUDIO WORKSTATION



Before using this unit, carefully read the sections entitled: "IMPORTANT SAFETY INSTRUCTIONS" (Owner's Manual p. 2), "USING THE UNIT SAFELY" (Owner's Manual p. 3), and "IMPORTANT NOTES" (Owner's Manual p. 5). These sections provide important information concerning the proper operation of the unit. Additionally, in order to feel assured that you have gained a good grasp of every feature provided by your new unit, the Owner's Manual, and Appendices should be read in their entirety.
These manuals should be saved and kept on hand as a convenient reference.

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Roland US Web Site: www.rolandus.com

CAUTION

RISK OF ELECTRIC SHOCK
DO NOT OPEN

ATTENTION: RISQUE DE CHOC ELECTRIQUE NE PAS OUVRIR

CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK,
DO NOT REMOVE COVER (OR BACK).
NO USER-SERVICEABLE PARTS INSIDE.
REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the product.

INSTRUCTIONS PERTAINING TO A RISK OF FIRE, ELECTRIC SHOCK, OR INJURY TO PERSONS.

IMPORTANT SAFETY INSTRUCTIONS
SAVE THESE INSTRUCTIONS

WARNING - When using electric products, basic precautions should always be followed, including the following:

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this apparatus near water.
6. Clean only with a dry cloth.
7. Do not block any of the ventilation openings. Install in accordance with the manufacturers instructions.
8. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
9. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. When the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10. Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
11. Only use attachments/accessories specified by the manufacturer.
12. Never use with a cart, stand, tripod, bracket, or table except as specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.

13. Unplug this apparatus during lightning storms or when unused for long periods of time.
14. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

For the U.K.

WARNING: THIS APPARATUS MUST BE EARTHED
IMPORTANT: THE WIRES IN THIS MAINS LEAD ARE COLOURED IN ACCORDANCE WITH THE FOLLOWING CODE.
GREEN-AND-YELLOW: EARTH, BLUE: NEUTRAL, BROWN: LIVE

As the colours of the wires in the mains lead of this apparatus may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows:

The wire which is coloured GREEN-AND-YELLOW must be connected to the terminal in the plug which is marked by the letter E or by the safety earth symbol ⏚ or coloured GREEN or GREEN-AND-YELLOW.

The wire which is coloured BLUE must be connected to the terminal which is marked with the letter N or coloured BLACK.

The wire which is coloured BROWN must be connected to the terminal which is marked with the letter L or coloured RED.

CAUTION: Danger of explosion if battery is incorrectly replaced.
Replace only with same or equivalent type.

USING THE UNIT SAFELY

INSTRUCTIONS FOR THE PREVENTION OF FIRE, ELECTRIC SHOCK, OR INJURY TO PERSONS

About ⚠WARNING and ⚠CAUTION Notices

⚠WARNING	Used for instructions intended to alert the user to the risk of death or severe injury should the unit be used improperly.
⚠CAUTION	Used for instructions intended to alert the user to the risk of injury or material damage should the unit be used improperly. * Material damage refers to damage or other adverse effects caused with respect to the home and all its furnishings, as well to domestic animals or pets.

About the Symbols

⚠	The △ symbol alerts the user to important instructions or warnings.The specific meaning of the symbol is determined by the design contained within the triangle. In the case of the symbol at left, it is used for general cautions, warnings, or alerts to danger.
🛇	The 🛇 symbol alerts the user to items that must never be carried out (are forbidden). The specific thing that must not be done is indicated by the design contained within the circle. In the case of the symbol at left, it means that the unit must never be disassembled.
●	The ● symbol alerts the user to things that must be carried out. The specific thing that must be done is indicated by the design contained within the circle. In the case of the symbol at left, it means that the power-cord plug must be unplugged from the outlet.

ALWAYS OBSERVE THE FOLLOWING

⚠WARNING

- Before using this unit, make sure to read the instructions below, and the Owner's Manual.

- Do not open or perform any internal modifications on the unit. (The only exception would be where this manual provides specific instructions which should be followed in order to put in place user-installable options; see Chapter 28.)

- Do not attempt to repair the unit, or replace parts within it (except when this manual provides specific instructions directing you to do so). Refer all servicing to your retailer, the nearest Roland Service Center, or an authorized Roland distributor, as listed on the "Information" page.

- Never use or store the unit in places that are:
  - Subject to temperature extremes (e.g., direct sunlight in an enclosed vehicle, near a heating duct, on top of heat-generating equipment); or are
  - Damp (e.g., baths, washrooms, on wet floors); or are
  - Humid; or are
  - Exposed to rain; or are
  - Dusty; or are
  - Subject to high levels of vibration.

- Make sure you always have the unit placed so it is level and sure to remain stable. Never place it on stands that could wobble, or on inclined surfaces.

⚠WARNING

- The unit should be connected to a power supply only of the type described in the operating instructions, or as marked on the rear side of unit.

- Use only the attached power-supply cord.

- Do not excessively twist or bend the power cord, nor place heavy objects on it. Doing so can damage the cord, producing severed elements and short circuits. Damaged cords are fire and shock hazards!

- This unit, either alone or in combination with an amplifier and headphones or speakers, may be capable of producing sound levels that could cause permanent hearing loss. Do not operate for a long period of time at a high volume level, or at a level that is uncomfortable. If you experience any hearing loss or ringing in the ears, you should immediately stop using the unit, and consult an audiologist.

- Do not allow any objects (e.g., flammable material, coins, pins); or liquids of any kind (water, soft drinks, etc.) to penetrate the unit.

WARNING

- Immediately turn the power off, remove the power cord from the outlet, and request servicing by your retailer, the nearest Roland Service Center, or an authorized Roland distributor, as listed on the “Information” page when:
  - The power-supply cord, or the plug has been damaged; or
  - If smoke or unusual odor occurs
  - Objects have fallen into, or liquid has been spilled onto the unit; or
  - The unit has been exposed to rain (or otherwise has become wet); or
  - The unit does not appear to operate normally or exhibits a marked change in performance.

- In households with small children, an adult should provide supervision until the child is capable of following all the rules essential for the safe operation of the unit.

- Protect the unit from strong impact.
  (Do not drop it!)

- Do not force the unit’s power-supply cord to share an outlet with an unreasonable number of other devices. Be especially careful when using extension cords—the total power used by all devices you have connected to the extension cord’s outlet must never exceed the power rating (watts / amperes) for the extension cord. Excessive loads can cause the insulation on the cord to heat up and eventually melt through.

- Before using the unit in a foreign country, consult with your retailer, the nearest Roland Service Center, or an authorized Roland distributor, as listed on the “Information” page.

- Keep lithium batteries out of reach of small children. If a child has accidentally swallowed a battery, see a doctor immediately.

- Lithium batteries must never be recharged, heated, taken apart, or thrown into a fire or water.

- Always turn the unit off and unplug the power cord before attempting installation of the circuit board (model no. VS8F-2; p. 371).

- DO NOT play a CD-ROM disc on a conventional audio CD player. The resulting sound may be of a level that could cause permanent hearing loss. Damage to speakers or other system components may result.

CAUTION

- The unit should be located so that its location or position does not interfere with its proper ventilation.

- Always grasp only the plug on the power-supply cord when plugging into, or unplugging from, an outlet or this unit.

- Any accumulation of dust between the power plug and the power outlet can result in poor insulation and lead to fire. Periodically wipe away such dust with a dry cloth. Also, disconnect the power plug from the power outlet whenever the unit is to remain unused for an extended period of time.

- Try to prevent cords and cables from becoming entangled. Also, all cords and cables should be placed so they are out of the reach of children.

- Never climb on top of, nor place heavy objects on the unit.

- Never handle the power cord or its plugs with wet hands when plugging into, or unplugging from, an outlet or this unit.

- Before moving the unit, disconnect the power plug from the outlet, and pull out all cords from external devices.

- Before cleaning the unit, turn off the power and unplug the power cord from the outlet (p. 78).

- Whenever you suspect the possibility of lightning in your area, pull the plug on the power cord out of the outlet.

- Use only the specified type (model no. CR2032) of lithium battery (Chapter 28). Be sure to insert it as directed (to ensure correct polarity).

- Used lithium batteries must be disposed of in compliance with whatever regulations for their safe disposal that may be observed in the region in which you live.

- Install only the specified circuit board(s) (model no. VS8F-2). Remove only the specified screws (Chapter 28).

- Should you remove ground terminal screw and bottom cover screws, make sure to put them in a safe place out of children's reach, so there is no chance of them being swallowed accidentally.

Important Notes

In addition to the items listed under "IMPORTANT SAFETY INSTRUCTIONS" and "USING THE UNIT SAFELY" on pages 3 and 4, please read and observe the following:

Power Supply

- Do not use this unit on the same power circuit with any device that will generate line noise (such as an electric motor or variable lighting system).

- Before connecting this unit to other devices, turn off the power to all units. This will help prevent malfunctions and/or damage to speakers or other devices.

Placement

- Using the unit near power amplifiers (or other equipment containing large power transformers) may induce hum. To alleviate the problem, change the orientation of this unit; or move it farther away from the source of interference.

- This device may interfere with radio and television reception. Do not use this device in the vicinity of such receivers.

- Noise may be produced if wireless communications devices, such as cell phones, are operated in the vicinity of this unit. Such noise could occur when receiving or initiating a call, or while conversing. Should you experience such problems, you should relocate such wireless devices so they are at a greater distance from this unit, or switch them off.

- Observe the following when using the unit's disk drive.
  - Install the unit on a solid, level surface.
  - Do not move the unit or subject it to vibration while the drive is operating.

- Do not expose the unit to direct sunlight, place it near devices that radiate heat, leave it inside an enclosed vehicle, or otherwise subject it to temperature extremes. Excessive heat can deform or discolor the unit.

- When moved from one location to another where the temperature and/or humidity is very different, water droplets (condensation) may form inside the unit. Damage or malfunction may result if you attempt to use the unit in this condition. Therefore, before using the unit, you must allow it to stand for several hours, until the condensation has completely evaporated.

Maintenance

- For everyday cleaning wipe the unit with a soft, dry cloth or one that has been slightly dampened with water. To remove stubborn dirt, use a cloth impregnated with a mild, non-abrasive detergent. Afterwards, be sure to wipe the unit thoroughly with a soft, dry cloth.

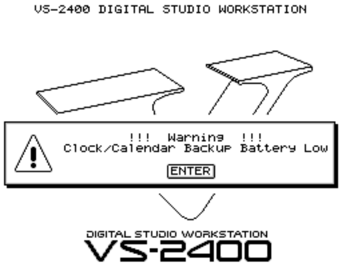
- Never use benzine, thinners, alcohol or solvents of any kind, to avoid the possibility of discoloration and/or deformation.

Repairs and Data

- Please be aware that all data contained in the unit's memory may be lost when the unit is sent for repairs. Important data should always be backed up on a storage device (e.g., CD-R/RW disc), or written down on paper (when possible). During repairs, due care is taken to avoid the loss of data. However, in certain cases (such as when circuitry related to memory itself is out of order), we regret that it may not be possible to restore the data, and Roland assumes no liability concerning such loss of data.

Memory Backup

- This unit contains a battery which powers the unit's memory circuits while the main power is off. When this battery becomes weak, the message shown below will appear in the display. Once you see this message, have the battery replaced with a fresh one as soon as possible to avoid the loss of all data in memory. To have the battery replaced, consult with your retailer, the nearest Roland Service Center, or an authorized Roland distributor, as listed on the "Information" page.



!!! Warning !!!
Clock/Calendar Backup Battery Low

VS-2400 DIGITAL STUDIO WORKSTATION
ENTER
DIGITAL STUDIO WORKSTATION
VS-2400

Additional Precautions

- Please be aware that the contents of memory can be irretrievably lost as a result of a malfunction, or the improper operation of the unit. To protect yourself against the risk of loosing important data, we recommend that you periodically save a backup copy of important data you have stored in the unit's memory on a storage device (e.g., CD-R/RW disc).

- Unfortunately, it may be impossible to restore the contents of data that was stored on a storage device (e.g., CD-R/RW disc) once it has been lost. Roland Corporation assumes no liability concerning such loss of data.

- Use a reasonable amount of care when using the unit's buttons, sliders, or other controls; and when using its jacks and connectors. Rough handling can lead to malfunctions.

- Never strike or apply strong pressure to the display.

- When connecting / disconnecting all cables, grasp the connector itself—never pull on the cable. This way you will avoid causing shorts, or damage to the cable's internal elements.

- A small amount of heat will radiate from the unit during normal operation.

- To avoid disturbing your neighbors, try to keep the unit's volume at reasonable levels. You may prefer to use headphones, so you do not need to be concerned about those around you (especially when it is late at night).

- When you need to transport the unit, package it in the box (including padding) that it came in, if possible. Otherwise, you will need to use equivalent packaging materials.

- Use a cable from Roland to make the connection. If using some other make of connection cable, please note the following precautions.
  - Some connection cables contain resistors. Do not use cables that incorporate resistors for connecting to this unit. The use of such cables can cause the sound level to be extremely low, or impossible to hear. For information on cable specifications, contact the manufacturer of the cable.

Handling the Internal Hard Disk Drive

- Please note that the hard disk is a consuming product. To protect yourself against risk of loosing important data by accidental disk damage, we recommend that you periodically save a backup copy on the CD-R/RW.

- Before turning off the power of VS-2400CD, be sure to perform the shutdown (See Chapter 4) procedure. Failure to do so may result in the loss of project data or damage to the hard disk.

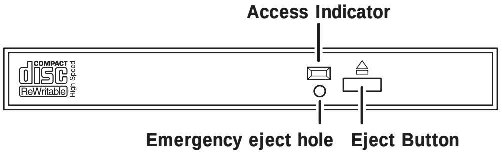
- Do not turn off the power while the hard disk is operating.

- While using the VS-2400CD, be careful not to subject the unit to vibration or shock, and avoid moving the unit while the power is turned on.

- Install the unit on a solid, level surface in an area free from vibration. If the unit must be installed at an angle, be sure the installation does not exceed the permissible range.

- Avoid using the unit immediately after it has been moved to a location with a level of humidity that is greatly different than its former location. Rapid changes in the environment can cause condensation to form inside the drive, which will adversely affect the operation of the drive. When the unit has been moved, allow it to become accustomed to the new environment (allow a few hours) before operating it.

Handling the CD-RW Drive



- Install the unit on a solid, level surface in an area free from vibration.

- Avoid using the unit immediately after it has been moved to a location with a level of humidity that is greatly different than its former location. Rapid changes in the environment can cause condensation to form inside the drive, which will adversely affect the operation of the drive and / or damage discs. When the unit has been moved, allow it to become accustomed to the new environment (allow a few hours) before operating it.

- It is strictly restricted to eject tray using emergency eject hall during VS-2400CD is operating (while the DISK indicator of VS-2400CD or access indicator of built-in CD-RW drive is lit).

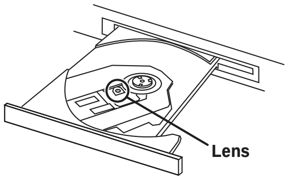
- Remove any disc from the drive before powering up or down.

- When you carry VS-2400CD, remove the disc from the loading tray.

- To avoid the risk of malfunction and / or damage, insert only discs with COMPACT disc into the CD-RW drive. Never insert any other type of disc. Avoid getting paper clips, coins, or any other foreign objects inside the drive.

- Do not touch the lens.

- When the lens is dirty, clean the lens with a commercial lens blower.



Handling CD-R/CD-RW Discs

⚠WARNING

- DO NOT play a CD-R / RW disc (CD-R / RW disc on which song data has been backed up) on a conventional audio CD player. The resulting sound may be of a level that could cause permanent hearing loss. Damage to speakers or other system components may result.

- Upon handling the discs, please observe the following.
  - Do not touch the recorded surface of the disc.
  - Do not use in dusty areas.
  - Do not leave the disc in direct sunlight or an enclosed vehicle.

- Avoid touching or scratching the shiny underside (encoded surface) of the disc. Damaged or dirty discs may not read / write properly. Keep your discs clean using a commercially available CD cleaner.

- Keep the disc in the case.

- Do not keep the disc in the CD-RW drive for a long time.

- Do not put a sticker on the label of the disc.

- Wipe the disc with a soft and dry cloth radially from inside to outside. Do not wipe along circumference.

- Do not use benzine, record cleaner spray or solvents of any kind.

- Do not bend the disc.

Handling CD-ROMs

- Avoid touching or scratching the shiny underside (encoded surface) of the disc. Damaged or dirty CD-ROM discs may not be read properly. Keep your discs clean using a commercially available CD cleaner.

Copyright

- Unauthorized recording, distribution, sale, lending, public performance, broadcasting, or the like, in whole or in part, of a work (musical composition, video, broadcast, public performance, or the like) whose copyright is held by a third party is prohibited by law.

- When exchanging audio signals through a digital connection with an external instrument, this unit can perform recording without being subject to the restrictions of the Serial Copy Management System (SCMS). This is because the unit is intended solely for musical production, and is designed not to be subject to restrictions as long as it is used to record works (such as your own compositions) that do not infringe on the copyrights of others. (SCMS is a feature that prohibits second-generation and later copying through a digital connection. It is built into MD recorders and other consumer digital-audio equipment as a copyright-protection feature.)

- Do not use this unit for purposes that could infringe on a copyright held by a third party. We assume no responsibility whatsoever with regard to any infringements of third-party copyrights arising through your use of this unit.

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1—Welcome

Congratulations on the purchase of your Roland VS-2400CD Digital Studio Workstation. The VS-2400CD will allow you to take your music—or any other kind of sound—from the first spark of inspiration to completed recording.

Although the VS-2400CD is designed to be simple to operate, the sheer number of tools it provides do require some introduction and explanation. That's what the *VS-2400CD Owner's Manual* is for. Of course, what you do with these tools is up to you and your imagination.

If you've purchased a VS8F-2 Effect Board, MB-24 Meter Bridge or VE-7000 for your VS-2400CD, you may want see Chapter 28, beginning on Page 371 before reading the *Owner's Manual*.

Your VS-2400CD is an extremely reliable device. However, there's no guarantee against data loss due to improper use of the VS-2400CD or unforeseen events. Roland Corporation assumes no liability concerning such loss of data.

About this Manual

How the *VS-2400CD Owner's Manual* is Organized

The *VS-2400CD Owner's Manual* explains the VS-2400CD 's architecture, features, operations and settings. It also provides application suggestions and presents step-by-step procedures. To get the most from your VS-2400CD, we recommend reading the entire manual. The structure of the manual generally reflects the order in which a typical signal flows through the VS-2400CD, with extra explanations for beginners at the front.

If you'd like to get to work immediately, you may first want to:

- *set the VS-2400CD's internal clock and calendar*—The VS-2400CD time-stamps each recording to make it easy for you to keep track of your work. See Page 65 for instructions.
- *connect a mouse, ASCII keyboard and VGA monitor*—See Page 64 for more information.

Here's where you'll find instructions that explain how to perform some basic operations:

- *"Creating a New Project"*—Page 94
- *"Recording a New Track"*—Page 173
- *"Backing Up a Project"*—Page 102
- *"Inserting Effects on an Input or Track Channel"*—Page 211
- *"Setting Up an Internal Loop Effect"*—Page 207
- *"Mixing"*—Page 196

These procedures will get you up and running, but, of course, they're no substitute for actually reading the manual and really learning how the VS-2400CD's features work.

We highly recommend connecting a VGA monitor to your VS-2400CD—it makes the VS-2400CD even easier and more fun to use. With a VGA monitor, you can perform most VS-2400CD operations onscreen using your mouse. Chapters 29-35 describe using a VGA monitor with your VS-2400CD.

To make it easy for you to find the manual's many step-by-step procedures, we've assembled a "Step-By-Step Instruction Finder" that starts on Page 21. There's also a standard Table of Contents at the front of the book and an Index in back. Additional information can be found in "Supplemental Information," starting on Page 441.

In this manual, illustrations that show VS-2400CD screens reflect their appearance at the time the manual was written. As the VS-2400CD's software is enhanced through operating system upgrades, the appearance of the VS-2400CD's screens may change.

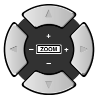
Names

Throughout the *VS-2400CD Owner's Manual*, the names of buttons, knobs, faders, jacks—and settings that appear in the display—are shown exactly as they appear on the VS-2400CD itself. As a result, names printed on the VS-2400CD are shown in capital letters. For example, the button labeled "AUTOMIX" will appear in the manual as the AUTOMIX button, or simply AUTOMIX, as in "Press AUTOMIX." Settings on the display are shown in the same lower- and upper -case letters they use onscreen.

A few buttons serve several purposes and have long names. In such cases, we'll refer to the button by the name that reflects its current use. For example, if we want to view CH EDIT parameters, we'll say to press the "desired CH EDIT button," not the "desired CH EDIT/SELECT/AUTOMIX STATUS" button. Some buttons have two labels. If we need to refer to both, we'll show the labels with a bullet between them, as with the HOME•DISPLAY button.

The F 1-6 buttons beneath the display can do different things at different times. We'll show an F button's current function in parentheses after its name, as in "F1 (INPUT)."

The four arrow keys are a special case. Sometimes, we'll collectively refer to ◀, ▶, ▲ and ▼ as "cursor" buttons since they allow you to move, or "cursor," around in the VS-2400CD's display.



Note, Tip, Glossary and Warning Icons

Throughout the *VS-2400CD Owner's Manual*, you find the symbols shown below in the left-hand margins. Here's what these symbols mean.

Notes provide additional information about the topic described in the main text.

Tips offer interesting ways to use the feature under discussion. They'll also let you know why you should care about what's being said.

This symbol will be of special interest to beginners, because the word—or words—to its right can be found in the glossary that starts on Page 469.

Make sure you pay attention whenever you see the *Warning* symbol. Warnings provide important information that will help you avoid damage to your recordings, VS-2400CD, other equipment or even yourself.

Other Documents in the VS-2400CD Box

The *VS-2400CD Appendices* provide additional detailed information not included in the *Owner's Manual*. For example, the VS-2400CD will display an error message if you attempt to perform an operation that the VS-2400CD doesn't allow—the *Appendices* contain a list of all error messages and an explanation of what each one means. You'll also find a Troubleshooting section that can help you figure out what to do if the VS-2400CD behaves in an unexpected manner.

Getting More Help

If you have questions that can't be answered by the *VS-2400CD Owner's Manual*, Roland offers a number of informational resources.

The Roland US Web site

Visit the Roland US Web site at: *http://www.RolandUS. com*. You'll find lots of information about the VS-2400CD and a wealth of support materials. If you're new to recording or mixing, you'll especially enjoy the downloadable booklets for beginners.

The Roland US Faxback System

If you can receive faxes, you can access our library of support documents 24 hours a day, seven days a week. Call 323-890-3780 for more information about using our faxback system.

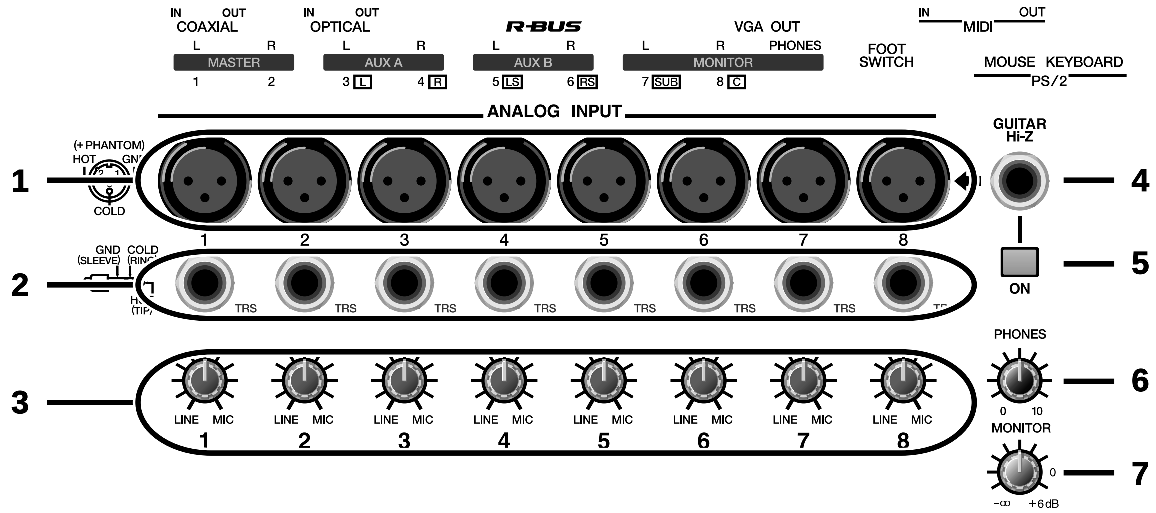
Roland US Product Support

If you need help from a real, live person, call the Roland US Product Support team at 323-890-3740, Extension 3741.

2—Getting Around

The Top Panel of the VS-2400CD

Analog Input Jacks


IN OUT
COAXIAL
IN OUT
OPTICAL
R-BUS
VGA OUT
IN MIDI OUT
L R
MASTER
1 2
L R
AUX A
3 L 4 R
L R
AUX B
5 LS 6 RS
L R
MONITOR
7 SUB 8 C
PHONES
FOOT SWITCH
MOUSE KEYBOARD
PS/2
ANALOG INPUT
(+PHANTOM)
HOT
COLD
GND (SLEEVE)
COLD (RING)
TRS
LINE MIC
1 2 3 4 5 6 7 8
GUITAR Hi-Z
ON
PHONES
0 10
MONITOR
0
-∞ +6dB
1
2
3
4
5
6
7

The analog input jacks allow you to bring analog audio into the VS-2400CD's 24-bit analog-to-digital (A/D) converters using balanced XLR connectors and balanced or unbalanced 1/4" connectors. We'll explain how to correctly set an analog input's level in "Setting Analog Input Levels" on Page 126.

Don't use the same-numbered XLR and TRS input jack—each SENS knob controls both jacks, so you won't have independent control of the two jacks' signals.

Analog, 24-bit, balanced, XLR, unbalanced, TRS, dB

1—XLR Inputs 1-8

Each of the eight XLR input jacks accepts an input signal from a balanced XLR connector.

The VS-2400CD can provide phantom power for a condenser-type mic connected to an XLR jack. See "To Turn an XLR Input Jack's Phantom Power On or Off" on Page 126.

2—TRS Inputs 1-8

Connect a 1/4" phone-type TRS balanced or unbalanced audio connector to any of the eight TRS input jacks.

3—SENS Knobs 1-8

You can adjust the sensitivity of an XLR or TRS input jack by turning its SENS—for "Sensitivity"—knob. Turn the knob all the way counter-clockwise for a line level (+14 dBu) or all the way clockwise for a mic level (-50 dBu) device.

When no input signal is connected or in use, turn each input jack's SENS knob all the way counter-clockwise to avoid unwanted noise.

Mic level, line level, dBu

4—GUITAR HI-Z Jack

If you'd like to plug an electric guitar or bass directly into the VS-2400CD, connect it to the GUITAR HI-Z (for "high impedance") 1/4" phone-type jack for a loud, clean signal with a minimum of noise.

High impedance

You can use either the GUITAR HI-Z input jack or TRS Input 8, but not both at the same time. The setting of the GUITAR HI-Z ON switch determines which of these jacks is turned on.

5—GUITAR HI-Z ON Switch

Press the GUITAR HI-Z ON switch to turn on the GUITAR HI-Z input jack, and to turn off TRS Input 8—when the switch is locked in its "in" position, the GUITAR HI-Z input jack is activated.

Monitor/Display Controls

6—PHONES Knob

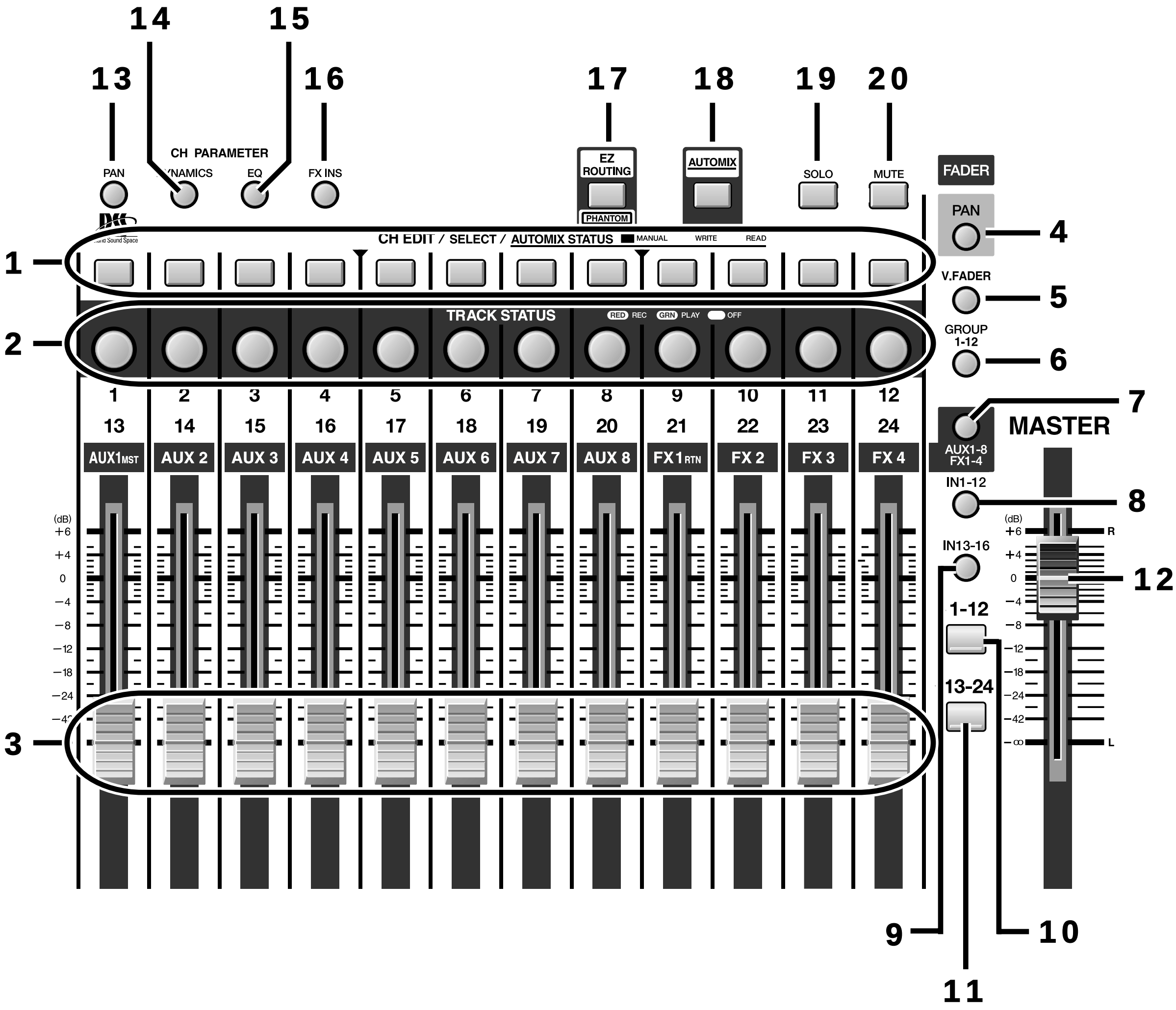
This knob controls how loudly the VS-2400CD's MONITOR output is heard through headphones connected to the PHONES jack. To learn how to set your headphone listening level, see "Adjusting Your Listening Level" on Page 74.

7—MONITOR Knob

This knob controls the volume of the VS-2400CD's stereo MONITOR bus and outputs. It can also set the basic listening level of the PHONES jacks.

Bus

Channel Strips Area


14
15
13
16
17
18
19
20
CH PARAMETER
PAN
DYNAMICS
EQ
FX INS
EZ ROUTING
PHANTOM
AUTOMIX
SOLO
MUTE
FADER
PAN
4
1
CH EDIT / SELECT / AUTOMIX STATUS
MANUAL
WRITE
READ
V.FADER
5
2
TRACK STATUS
RED REC
GRN PLAY
OFF
GROUP 1-12
6
1 2 3 4 5 6 7 8 9 10 11 12
13 14 15 16 17 18 19 20 21 22 23 24
AUX1MST
AUX 2
AUX 3
AUX 4
AUX 5
AUX 6
AUX 7
AUX 8
FX1RTN
FX 2
FX 3
FX 4
7
AUX1-8 FX1-4
MASTER
IN1-12
8
(dB)
+6
+4
0
−4
−8
−12
−18
−24
−42
−∞
R
L
IN13-16
12
1-12
13-24
3
9
10
11

Each of the first twelve channel strips contains—reading from the bottom up—a fader, a TRACK STATUS button and a CH EDIT/SELECT/AUTOMIX STATUS button. Channel strips are described in detail in Chapter 9. To the immediate right of the channel strips are the FADER buttons, which are described in detail starting on Page 133. To the far right is the MASTER fader (Page 137)

1—CH EDIT/SELECT/AUTOMIX STATUS Buttons 1-12

When working with input, track and FX ("effect") return channels, press this button to view a channel's CH EDIT settings—the button lights to show that the input, track or FX return channel is selected.

When working in Automix mode, the lit or unlit state of each of these buttons shows the current status of its corresponding Automix track. The Automix key to the right of "AUTOMIX STATUS" shows what each state means.

AUTOMIX STATUS ■ MANUAL ⬚ WRITE ☐ READ

2—TRACK STATUS Buttons 1-12

When working with track channels, press this button to set each track channel's status—the current status of the button is shown by its color. The TRACK STATUS key to the right of "TRACK STATUS" shows what each color means.

(RED) REC (GRN) PLAY ( ) OFF

The TRACK STATUS buttons also provide a quick way to select destination tracks during track editing.

3—Channel Strip Faders

Use each channel strip fader to make adjustments to its channel's output level. When using the channel strips as a MIDI control surface—see Page 286—use the faders to transmit MIDI Control Change messages.

You can use the faders to control a variety of settings. See "The FADER ASSIGN Button" on Page 136.

4—PAN Button

When the channel strips are controlling input channels, track channels, the Aux masters or the effect returns, press PAN to set the stereo position of a channel using its fader—its light turns on to show that the faders are controlling stereo panning. Press PAN again, turning the PAN light off, to return the channel strip to normal operation.

When the channel strips are controlling fader groups or when the V.Fader feature is turned on, the PAN button has no effect and will not light.

5—V.FADER Button

Press V. FADER to change the mixer into a MIDI control surface (see Page 286)

6—GROUP 1-12 Button

Press the GROUP 1-12 button to assign Fader Groups 1-12 (see Page 150) to the 12 channel strips. When GROUP 1-12 is lit, each fader controls the level of the corresponding fader group.

7—AUX1-8/FX1-4 Button

To control the eight Aux busses and four stereo effect returns using the 12 channel strips, press AUX1-8/FX-14.

8—IN 1-12 Button

Press the IN 1-12 button to assign the 12 channel strips to Input Channels 1-12 (see Page 133).

9—IN 13-16 Button

Press the IN 13-16 button to assign the first four channel strips to Input Channels 13-16.

When IN 13-16 is lit, only the first four channel strips are active.

10—Tr 1-12 Button

Press Tr 1-12 to assign the 12 channel strips to Track Channels 1-12 (see Page 133).

11—Tr 13-24 Button

Press Tr 13-24 to assign the 12 channel strips to Track Channels 13-24.

12—MASTER FADER

The position of the MASTER fader sets the level of the main stereo MASTER mix bus.

Since the MONITOR outputs and the PHONES jacks are typically set to listen to the MASTER mix bus, the position of the MASTER fader also affects your listening level.

13—CH PARAMETER PAN Button

Press PAN to display the PAN setting for the currently selected input or track channel (Page 152).

14—CH PARAMETER DYNAMICS Button

Press DYNAMICS to display the first dynamics CH EDIT setting (Page 152) for the currently selected input or track channel.

15—CH PARAMETER EQ Button

Press EQ to display the first EQ CH EDIT parameter (Page 157) for the currently selected input or track channel.

16—CH PARAMETER FX INS Button

Press FX INS to display the first effect insert CH EDIT setting (Page 211) for the currently selected input or track channel.

17—EZ ROUTING Button

Press EZ ROUTING to set up, load and save signal routings in the VS-2400CD:

To learn about	*see:*
Routing input signals to input channels	Chapter 9
Routing input channels to tracks	Chapter 12
Recording tracks onto other tracks	Chapter 14
Routing FX return channels to tracks	Chapter 17
Configuring the digital inputs	Chapter 9
Activating and de-activating phantom power	Chapter 9
Setting up output signals	Chapter 21
Sending channels to the internal effects	Chapter 16
Saving and loading EZ Routing templates	Chapter 22
Clearing routings	Chapter 22
Initializing routings	Chapter 22

? *Routing*

18—AUTOMIX Button

Press this button to turn Automix on (lit) or off (unlit). Hold down SHIFT and press AUTOMIX to view the AUTOMIX SETUP screen. See Chapter 25, starting on Page 313.

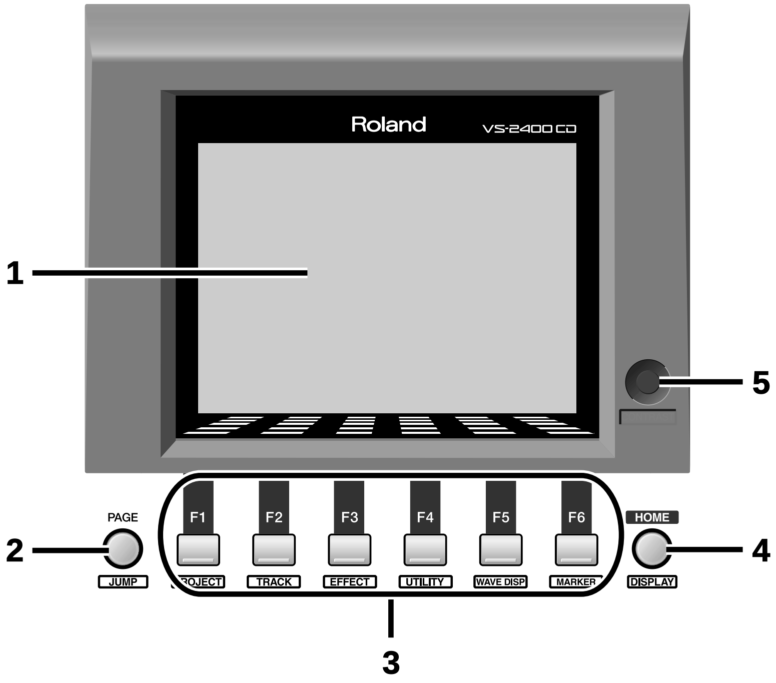
19—SOLO

Press SOLO to enter and exit Solo mode (Page 138).

20—MUTE

Press MUTE to enter and exit Mute mode (Page 138).

Display Area


Roland
VS-2400CD
1
5
PAGE
F1
F2
F3
F4
F5
F6
HOME
2
4
JUMP
PROJECT
TRACK
EFFECT
UTILITY
WAVE DISP
MARKER
DISPLAY
3

The LCD display and its buttons are central to everything you do on the VS-2400CD. The F buttons discussed in Chapter 4, on Page 66.

1—LCD Display

The LCD display is your window to the VS-2400CD's operations. In addition to providing you vital information, the display is central to all VS-2400CD activity.

2—PAGE•JUMP Button

Some activities on the VS-2400CD require more than a single screenful of settings—each screenful is called a "page." For such activities, you can repeatedly press the PAGE button to cycle through the available pages.

You can jump to any location in a project by holding down SHIFT and pressing PAGE•JUMP.Enter the desired time location on the VS-2400CD's numeric keypad or Time/Value dial. You can select the desired time in time code (01:01:01:01.01)—at the left of the dialog that appears—or measures, beats and clocks (001-01-001) at the right. Press ENTER/YES to move to the selected location.

3—F Buttons 1-6

The F 1-6 buttons are "soft" buttons whose job changes depending on what you're doing. When an F button is active, its current function is shown on the display above the button. For more on how the F buttons work, see Page 66.

In addition, when you hold down SHIFT, the F buttons display a variety of menus and screens:

Hold down SHIFT and press:	*To display:*
F1 (PROJECT)	the PROJECT menu. When you press PROJECT, a menu appears in which you'll find an assortment of project-management tools and tools for working with your internal IDE drive.
F2 (TRACK)	the TRACK menu that contains the TRACK region and phrase editing sub-menus.
F3 (EFFECT)	the EFFECT menu to set up the VS-2400CD's internal effects. Chapter 5 discusses important underlying effects concepts. Chapter 16 provides the specifics on using the VS-2400CD's internal effects.
F4 (UTILITY)	the UTILITY menu. The UTILITY button provides access to the UTILITY menu, which offers a wide variety of settings that determine the behavior of the VS-2400CD. See Chapter 27, starting on Page 351.
F5 (WAVE DISP)	the wave display screen that allows you to view the currently selected track's audio as a detailed waveform rather than a simple rectangle.
F6 (MARKER)	the Marker window in which you can create, clear, and recall markers.

? *IDE drive, waveform*

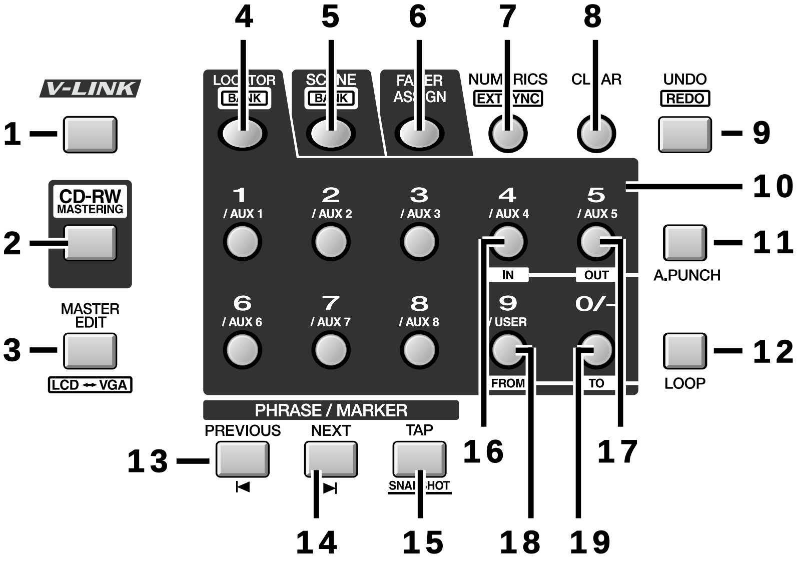
4—HOME•DISPLAY Button

Press the HOME•DISPLAY button to return to the VS-2400CD's Home screen, described in detail in Chapter 8, beginning on Page 115. Hold SHIFT and press the button to change what appears in the playlist area of the Home screen (Page 120).

5—CONTRAST Knob

The CONTRAST knob allows you to change the contrast of the VS-2400CD's display. Turn the knob until the display looks its best from your viewing angle.

Keypad Area


V-LINK
CD-RW MASTERING
MASTER EDIT
LCD ↔ VGA
LOCATOR BANK
SCENE BANK
FADER ASSIGN
NUMERICS EXT SYNC
CLEAR
UNDO REDO
1 / AUX 1
2 / AUX 2
3 / AUX 3
4 / AUX 4
5 / AUX 5
6 / AUX 6
7 / AUX 7
8 / AUX 8
9 / USER
0/-
IN
OUT
FROM
TO
A.PUNCH
LOOP
PHRASE / MARKER
PREVIOUS
NEXT
TAP
SNAPSHOT
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19

1—V-LINK Button

Press the V-LINK button—so it lights—to configure the VS-2400CD for use with a video editing or presentation system. When V-LINK is active, the VS-2400CD and video equipment are synchronized for tightly integrated operation. For details regarding synchronization, see Chapter 23.

MMC, MTC, slave

2—CD-RW•MASTERING Button

Press this button to view the CD-RW/MASTERING menu from which you can perform all CD-related operations. Hold down SHIFT and PRESS CD-RW•MASTERING to jump to the VS-2400CD's Mastering Room, where you can complete the master mix of a project and create an audio CD. See Chapter 26, starting on Page 329.

Mastering, CD-R/RW drive

3—MASTER EDIT•LCD↔VGA

Press MASTER EDIT•LCD↔VGA to display the MASTER EDIT VIEW screen (Page 201, Page 203). When you've connected an external VGA monitor to the VS-2400CD, hold down SHIFT and press MASTER EDIT•LCD↔VGA to select your main display. See "The Main Display and the Info Display" on Page 379 for details.

4—LOCATOR•BANK Button

Press the LOCATOR•BANK button so it's lit to store and recall locators using the numeric keypad (see "10—Numeric keypad" on Page 43). A locator remembers a particular now line position within a project—when you recall the locator, the now line instantly jumps back to that time position. Locators are discussed in detail in "Locators" on Page 179.

Each project can contain up to 100 locators arranged in groups, or "banks," of ten locators each. To select a locator bank, hold down SHIFT, press LOCATOR•BANK so it's lit, and press the desired bank's number on the numeric keypad.

5—SCENE•BANK Button

Press the SCENE•BANK button so it's lit to store and recall scenes using the numeric keypad (see "10—Numeric keypad" on Page 43). A scene stores your current mixer settings, allowing you to save different versions of your project for instant recall. Scenes are discussed in detail in "Scenes" on Page 139.

Each project can contain up to 100 scenes in groups, or "banks," of ten scenes each. To select a scene bank, hold down SHIFT, press SCENE•BANK so it's lit, and press the desired bank's number on the numeric keypad.

6—FADER ASSIGN Button

When you press the FADER ASSIGN button so that it flashes, you can press a number on the numeric keypad to assign the faders to the job of sending signals from the individual channel strips (Page 35) to the corresponding Aux bus. In addition, you can press 9•USER to assign them to another setting of your choice. See Page 136.

7—NUMERICS•EXT SYNC Button

Press NUMERICS so that it lights to enter numeric values for various settings using the VS-2400CD's keypad or a connected ASCII keyboard. When NUMERICS is lit, the area into which you can type becomes selected on the display. See Page 72.

Hold down SHIFT and press NUMERICS•EXT SYNC so that it lights to synchronize the VS-2400CD's playback to an external MTC-generating device. Press it again so that it's not lit when you want the VS-2400CD itself to provide the master timing reference (this is the VS-2400CD's normal operating mode). Synchronization is described in Chapter 23.

? *MTC, SMPTE*

8—CLEAR Button

To delete a locator, marker or scene, hold down CLEAR and press the desired locator, marker or scene (Page 139) number on the numeric keypad. To clear an edit point, hold down SHIFT and CLEAR and press the desired IN, OUT, FROM or TO button. To delete an Auto Punch point, hold down A.PUNCH and CLEAR and press the desired IN or OUT button. To clear a loop point, hold down LOOP and CLEAR and press the desired FROM or TO button.

9—UNDO•REDO Button

The VS-2400CD allows you to reverse—or "undo"—up to 999 of your last recording or editing actions. Press the UNDO•REDO button to view the Undo dialog. After undoing any action, you can also "redo" it by pressing UNDO•REDO while holding down SHIFT—the Redo dialog appears.

10—Numeric keypad

The numeric keypad serves two general purposes:

- You can type the desired number or numbers on it when storing and recalling locators, scenes and markers, or when entering values when NUMERICS is lit.
- When FADER ASSIGN is flashing, you can assign the faders to the job of sending signals from the individual channel strips to one of the eight Aux busses (Page 136) by pressing the desired 1-8 button, or to some other job by pressing 9•USER (Page 136).

Every set of ten items on the numeric keypad—banks, locators, scenes and so on—is numbered from 0 to 9.

11—A. PUNCH Button

Press this button to activate (lit) or de-activate (unlit) Auto Punch. See Page 186.

12—LOOP Button

Press this button to turn looping on (lit) or off (unlit). See Page 174.

13— PHRASE/MARKER PREVIOUS Button

Press PREVIOUS to move the now line to the beginning of the currently selected track phrase or to the end of the phrase immediately before it. Hold down SHIFT and press PREVIOUS to move the now line back in time to the nearest marker.

You can reverse the behavior of this button by resetting the UTILITY menu's PREVIOUS/NEXT Sw parameter, described on Page 356.

14—PHRASE/MARKER NEXT Button

- Press NEXT to move the now line to the end of the currently selected track phrase or to the beginning of the phrase immediately after it. Hold down SHIFT and press NEXT to move the now line forward in time to the nearest marker.

You can reverse the behavior of this button by resetting the UTILITY menu's PREVIOUS/NEXT Sw parameter, described on Page 356.

15—PHRASE/MARKER TAP•SNAPSHOT Button

Press TAP•SNAPSHOT to create a marker at the current position of the now line—the marker is numbered automatically. When AUTOMIX (Page 313) is lit, press AUTOMIX and this button to create a snapshot of your current mixer settings that can be recalled as part of an automated mix. Automix and snapshots are discussed in Chapter 25. Hold down CD-RW•MASTERING and press TAP•SNAPSHOT to place a CD track marker at the now line's current location.

16—IN Button (Keypad Button 4)

Hold down SHIFT and press the IN button to set the current position of the now line as the start of a region of data you want to edit. Hold down A.PUNCH and press IN to set the punch-in point during Auto Punch operations.

17—OUT Button (Keypad Button 5)

Hold down SHIFT and press the OUT button to set the current position of the now line as the end of a region of data you want to edit. Hold down A.PUNCH and press OUT to set the punch-out point during Auto Punch operations.

18—FROM Button (Keypad Button 9)

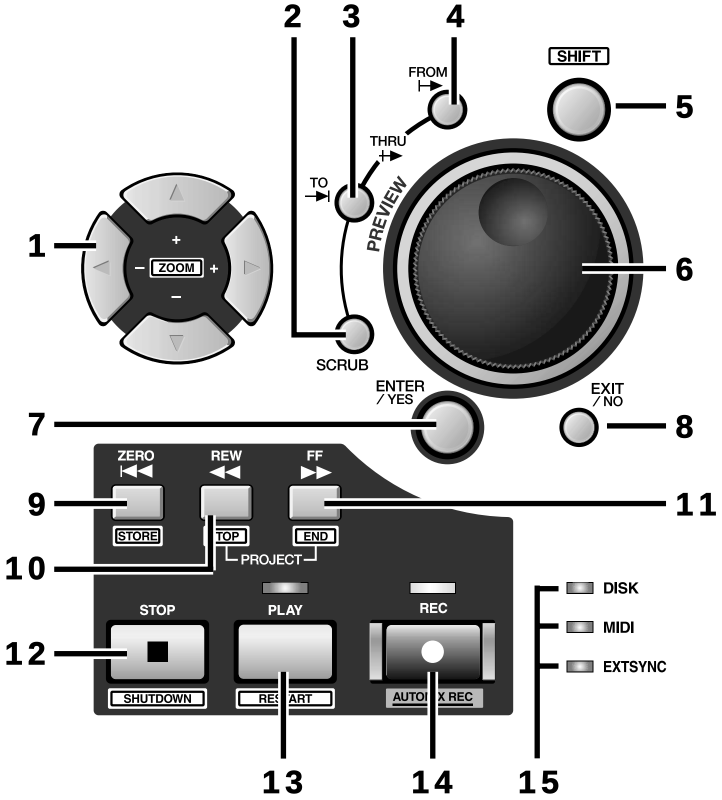
Hold down SHIFT and press FROM to select the current position of the now line as a time-reference point in a section of data to be moved or copied. When looping, press FROM while holding down LOOP when the now line's at the location you want to use as the start of your loop.

19—TO Button (Keypad Button 0/-)

Hold down SHIFT and press TO to select the current position of the now line as a location at which you want the FROM point to be placed when data is moved or copied. When looping, press TO while holding down LOOP when the now line's at the location you want to use as the end of your loop.

IN, FROM, OUT and TO work together, playing a part in a variety of editing operations. They're discussed as a group in Chapter 18, on Page 232.

Basic Controls and Navigation Tools


2
3
4
SHIFT
FROM
5
THRU
TO
PREVIEW
1
ZOOM
6
SCRUB
ENTER / YES
EXIT / NO
7
8
ZERO
REW
FF
9
11
STORE
TOP
END
PROJECT
10
DISK
MIDI
EXTSYNC
STOP
PLAY
REC
12
SHUTDOWN
13
14
15

This area contains frequently used controls that are part of many VS-2400CD operations.

1—◀ ▶ ▲ ▼ (Cursor)/ZOOM Buttons

Press the ◀, ▶, ▲ or ▼ cursor buttons to move the selection cursor (Page 65) around the VS-2400CD's display.

Hold down SHIFT and press the desired arrow button to zoom in and out on track data shown in the playlist area of the Home screen (Page 115) and other screens:

- Press ▶ to increase the horizontal magnification.
- Press ◀ to decrease the horizontal magnification.
- Press ▲ to increase the vertical magnification.
- Press ▼ to decrease the vertical magnification.

2—SCRUB Button

When you need to precisely locate a moment in a track, press SCRUB to activate the Scrub feature. When SCRUB is lit, you can turn the Time/Value dial to move the now line and listen to a tiny piece of the track play over and over—this lets you zero in on just the moment you're looking for. This can be very helpful when editing. To turn off scrubbing, press SCRUB again so its light goes out. See Page 178 to learn more.

3—PREVIEW TO Button

Press PREVIEW TO to listen to the last few moments leading up to the current location of the now line—you can set how much you want to hear. Hold SHIFT and press PREVIEW TO to jump to the start, or "top," of the audio recorded in the project.

4—PREVIEW FROM Button

Press PREVIEW FROM to listen to what occurs just after the current location of the now line—you can set how much you want to hear.

PREVIEW TO and PREVIEW FROM work together, and are all described in detail in "Preview" on Page 177.

To audition the project just before and after the current position of the now line, press PREVIEW FROM and PREVIEW TO at the same time for the PREVIEW THRU feature.

5—SHIFT Button

Many of the VS-2400CD's buttons have a secondary function. When you hold SHIFT and press one of these buttons, the button performs the function shown in the label beneath the button. See Page 68 for more information on using the SHIFT button.

6—Time/Value Dial

The Time/Value dial performs two important jobs:

- During project playback, you can turn the dial to move forward or backward in time. See Page 123 for more information.
- Turn the Time/Value dial to adjust settings.

7—ENTER/YES Button

Press ENTER/YES in response to a yes/no question shown on the display, to execute a procedure, mark an item currently selected on the display or select data for editing.

The ENTER/YES button often flashes to underscore that you're being asked a question on the display or that further options are available for your current activity.

8—EXIT/NO Button

Press EXIT/NO in response to a question on the display, to cancel an operation, exit the current screen or un-mark an object currently selected on the display.

The EXIT/NO button often flashes to underscore that you're being asked a question on the display.

9—ZERO•STORE Button

Press ZERO•STORE to return to the beginning of the project (Time 00h00m00s00f00)—see Page 122. Hold down SHIFT and press ZERO•STORE to save the current state of your project to your hard drive.

10—REW•PROJECT TOP Button

Press REW (for "Rewind") to move back gradually through a project. Hold SHIFT and press REW to jump to the start, or "top," of the audio recorded in the project.

11—FF•PROJECT END Button

Press FF (for "Fast Forward") to move gradually forward through a project. Hold SHIFT and press PREVIEW FROM to jump to the end of the audio recorded in the project.

12—STOP•SHUTDOWN Button

Press STOP to halt playback at the now line's current location—see Page 118. Hold down SHIFT and press STOP•SHUTDOWN to power down the VS-2400CD—you'll be asked if you want to save your project first.

13—PLAY•RESTART Button

Press PLAY•RESTART to begin playback from the current location of the now line—see Page 118. Hold down SHIFT and press PLAY •RESTART to restart the VS-2400CD instead of turning it off after you've performed a shutdown procedure (SHIFT + STOP•SHUTDOWN).

14—REC•AUTOMIX REC Button

Hold down REC•AUTOMIX REC and press PLAY to record audio onto a track (see Page 172). When the AUTOMIX button (Page 38) is lit, hold down REC•AUTOMIX and press PLAY to record mixer settings as realtime Automix data—see Chapter 25 (Page 313) to learn about automated mixing on the VS-2400CD.

Realtime

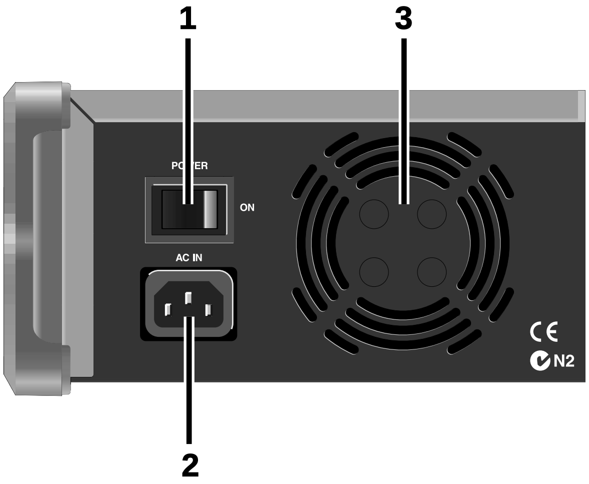
15—DISK/MIDI/EXT SYNC Indicator

Each of these indicators shows activity of a particular sort. When:

- *the DISK indicator lights*—the internal IDE drive is being read or being written to.
- *the MIDI indicator lights*—the VS-2400CD is receiving MIDI data from an external device.
- *the EXT SYNC indicator lights*—the VS-2400CD's transport is ready to be synchronized to—and driven by—an external device.

The Rear Panel of the VS-2400CD

1—POWER Switch


1
3
POWER
ON
AC IN
N2
2

Use the POWER switch to turn the VS-2400CD on and off.

Don't simply flip the POWER switch when you want to shut down the VS-2400CD—if you do this, data loss may occur. Make sure to use the proper shutdown procedure, described on Page 78.

2—AC IN Jack

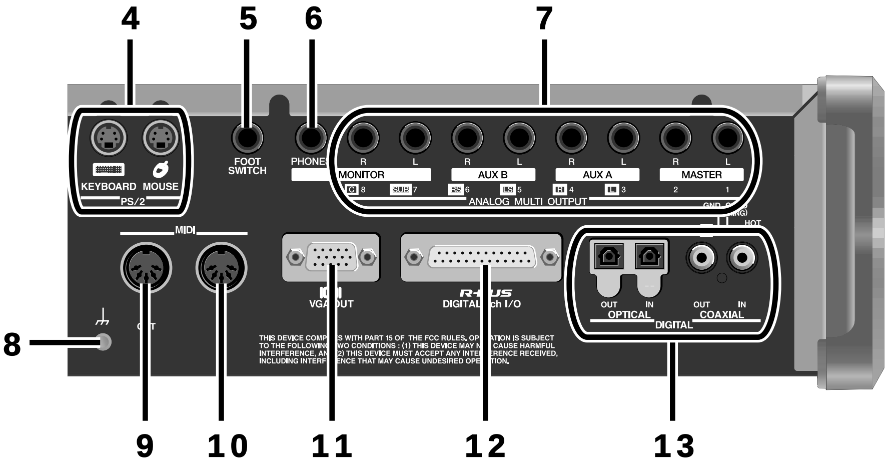
Connect one end of the supplied AC power cord to a grounded AC outlet, and the other end to the AC IN jack.

Use only the supplied AC power cord to prevent damage to your VS-2400CD.

3—Cooling Fan Exhaust Vent

The VS-2400CD contains a cooling fan that prevents it from overheating. The fan expels hot air through this exhaust vent.

Be sure never to block the cooling fan exhaust vent. If hot air from the VS-2400CD chassis isn't allowed to escape through this vent, the VS-2400CD may overheat and be damaged.


4
5
6
7
KEYBOARD
MOUSE
PS/2
FOOT SWITCH
PHONES
R
L
MONITOR
AUX B
AUX A
MASTER
ANALOG MULTI OUTPUT
MIDI
VGA OUT
R-BUS
DIGITAL
OUT
IN
OPTICAL
COAXIAL
DIGITAL
8
9
10
11
12
13

4—PS/2 KEYBOARD and MOUSE Jacks

Connect a PS/2 ASCII keyboard (purchased separately) and mouse to the PS/2 KEYBOARD and MOUSE jacks, respectively. See Page 62.

PS/2, ASCII

5—FOOT SWITCH Jack

You can control a variety of VS-2400CD functions using an optional foot switch—such as a Roland DP-2 or BOSS F5-SU—connected to this jack. See Page 354.

6—PHONES Jack

Connect standard stereo headphones (purchased separately) to this jack to listen to the VS-2400CD. The jack has its own volume control (Page 74). You can select the signal to be sent to the PHONES jack, as described in Chapter 21.

7—ANALOG MULTI OUTPUT Jacks 1-8

These are line-level analog output jacks. When used with balanced cables, they produce a +4dBu level. With unbalanced cables, they produce a level of -2dBu.

The label for each pair of jacks shows its factory default setting. However, you can assign different signals to the jacks if you wish. See Chapter 21, starting on Page 271.

8—Grounding Terminal

Connect the ground cable here.

9—MIDI OUT/THRU Jack

By default, this jack functions as a MIDI output jack—connect it to the MIDI input of any device to which you wish to send MIDI data from the VS-2400CD (see Chapter 23, Page 285). You can also set the MIDI OUT/THRU jack to function as a THRU jack that passes along any MIDI data the VS-2400CD receives from an external device (Page 286).

10—MIDI IN Jack

Connect the MIDI output of an external device to the MIDI IN jack when you want the VS-2400CD to receive and respond to MIDI data transmitted from an external device. See Chapter 23, starting on Page 285.

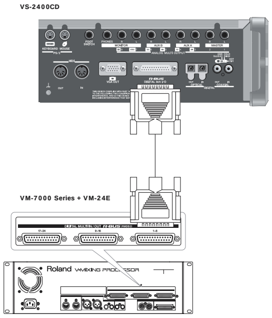
11—VGA OUT Jack

Connect an external VGA CRT color video monitor—purchased separately—to this DB-15-type VGA output jack. The monitor's Info Display provides helpful large-screen information about a variety of VS-2400CD operations. You'll find setup details on Page 64 and an introduction to the Info Display screens on Page 382.

12—R-BUS DIGITAL 8ch I/O Connector

Using Roland's R-BUS technology, you can bring digital audio into and out of the VS-2400CD by connecting it to any R-BUS-compliant external digital device. This includes the following Roland products (purchased separately):

- ADA-7000 8-Channel A/D-D/A Converter that provides additional analog inputs
- AE-7000 AES/EBU Interface that provides AES-EBU connectivity
- The RPC-1 R-BUS Interface Card for exchanging digital audio with a computer
- The VE-7000 Channel Edit Controller for editing CH EDIT parameters with dedicated knobs and buttons.
- The VM-7000 V-Mixing system
- XV-5080 128-Voice Synthesizer/Sample Playback Module



To connect the VS-2400CD to another R-BUS device, connect one end of an R-BUS cable to the VS-2400CD's R-BUS jack, and the other to an R-BUS jack on the external device.

Be sure to use the shortest Roland-approved R-BUS cables possible. Note that other cables—such as SCSI, RS-232C or parallel cables—may have connectors that look like R-BUS connectors, but they're not the same, and these cables can't be used successfully with R-BUS jacks.

The R-BUS jack can both receive and send eight separate digital audio signals, so only one connection is needed between two R-BUS devices.
R-BUS connections can also carry MIDI, MMC and MTC data in both directions.

See Page 369 to learn how to configure a connected R-BUS device. See Page 272 to learn how to route the desired signals to your R-BUS outputs.

R-BUS was formerly called "RMDB II" or "RMDB2" in earlier Roland products.

13—OPTICAL and COAXIAL Digital Audio Connectors

The VS-2400CD can both receive and transmit IEC 60958-format digital audio via its optical and coaxial digital IN and OUT connectors. Each connector carries a stereo digital audio signal. See Page 127 to learn how to successfully handle incoming digital audio. We'll explain how to route signals to either OUT connector starting on Page 272.

You can configure the VS-2400CD to record digital audio received from an external digital device connected to these jacks—see Page 130.

The coaxial IN and OUT jacks carry *only* digital audio signals. The IN jack won't accept standard analog audio signals, and the OUT jack doesn't produce them.

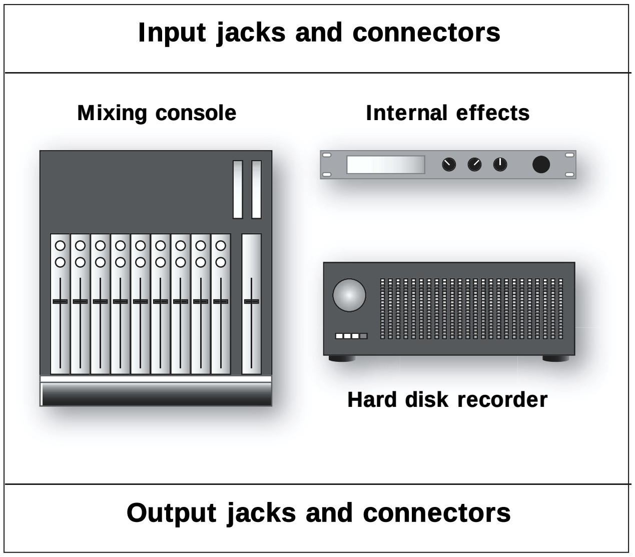
3—Introduction to the VS-2400CD

To master the VS-2400CD, it's important to understand the components that make up this self-contained 24-track recording studio. That's what we'll do here. More specific descriptions of how to use these components can be found in later chapters as noted.

While advanced V-2400CD users may already understand much of what's discussed here, everyone should make sure to read "Projects" on Page 56. This section introduces the project, the basic structure in which all VS-2400CD work takes place.

What's Inside the VS-2400CD?

Every recording studio has the same mission: the capturing of sound and the conversion of that sound into a form—an audio CD, a film or video soundtrack, a broadcast—that people can hear. If you were to go into any conventional multitrack recording studio, you'd therefore see the same sort of tools. All of these tools can also be found inside your VS-2400CD. Here's what's hidden inside its case:



Input Jacks and Connectors

Obviously, you've got to have a way to get sound into the VS-2400CD.

Analog and digital sounds travel through the cables that bring them to the VS-2400CD as electrical signals, called "input signals." The VS-2400CD provides jacks that recognize analog audio signals from microphones and from electric or electronic instruments. It also has digital connectors that accept digital audio signals from devices such as synthesizers or effect boxes with digital outputs, and from digital audio tape (DAT) decks and other kinds of digital recorders, including computer-based audio recorders. We'll discuss the VS-2400CD's analog input jacks and digital connectors in detail in Chapter 9, starting on Page 125.

The Mixing Console

The VS-2400CD contains a digital 52-channel mixing console.

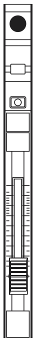
What's a Digital Mixing Console?

First, let's make sure we understand what a mixing console, or "mixer," is. A mixer is a device that lets you manipulate audio, and lets you combine multiple audio signals into a single sound, or a "mix." That mix can be in mono, stereo or Surround.

A *digital* mixer converts all audio signals into binary data—numbers—and performs all of its operations using complex mathematical equations. When you listen to the mixer—and any time audio comes out of its analog outputs—the sound is converted back into audible form. A digital mixer has several powerful advantages:

- Digital mixers produce extremely high-quality sound.
- They can memorize settings that can be restored with the touch of a button.
- They have a flexible internal structure—it's all just numbers under the hood, after all, not physical wires—so you can easily re-configure the mixer's internal connections in ways that aren't possible with a traditional analog mixer.

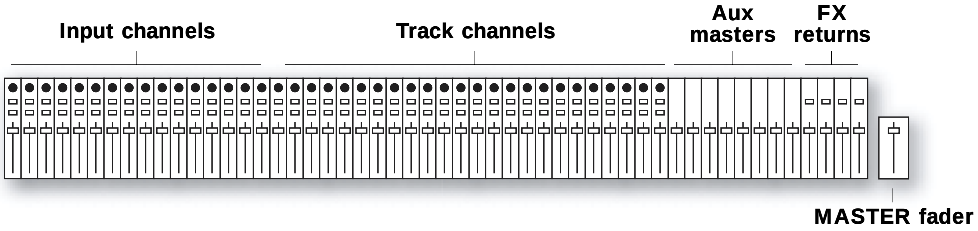
52 Channels?



In the VS-2400CD, each audio signal has its own set of controls with which you can manage and shape its sound. This set of controls is called a "channel." The VS-2400CD's mixer has 52 channels, all of which are always active and available:

- *16 input channels*—control signals received by 16 of the VS-2400CD's analog input jacks and digital connectors. The 24 input channels are sometimes collectively referred to as the "input mixer."
- *24 track channels*—control the sound of recordings being played back by the VS-2400CD's hard disk recorder. They may be referred to as the "track mixer."
- *8 Aux master channels*—control the master volume, or "level," of the eight Aux busses. We'll explain the Aux busses in Chapter 15.
- *4 FX return channels* control the sound produced by the VS-2400CD's internal effects.

As you can see, there are just 12 physical channel strips—plus the MASTER strip—on the VS-2400CD. If it actually had 52 physical channel strips, the VS-2400CD would be *huge*.



Even so, all 52 channels are available at all times. Here's how this is possible.

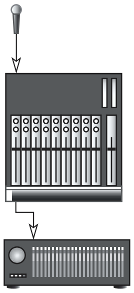
Once you've set a channel's controls the way you want them, the channel does its job without further action on your part—you only need to get to its controls when you want to change their settings. On the VS-2400CD, when you need to change a particular channel's settings, you press a FADER button, and the controls belonging to one of the physical channel strips become the controls for the selected channel.

We'll discuss the operation of the mixer in detail in Chapter 10, starting on Page 133.

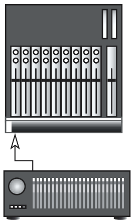
The Main Roles of the VS-2400CD Mixer

Two of the most important jobs the mixer performs in the VS-2400CD are this:

It helps you make an input signal sound the way you want it to on its way to a track.



It helps you get the track to sound the way you want, both during recording and while it's being played back when you're mixing or bouncing.



You'll also use the VS-2400CD's mixer to:

- mix input signals for your performers to listen to in headphones or stage monitors.
- send input signals to the VS-2400CD internal effects.
- set the amount of internal effects processing you want to add to your input signals.
- control the level of input signals sent to external devices for effect processing, and the sound of what comes back into the VS-2400CD from the external devices.
- listen to the hard disk recorder's tracks as you record so that you can hear what they're recording.
- send tracks to the internal effects.
- set the amount of internal effects processing you want to hear on your tracks.
- control the level of tracks sent to external devices for effect processing, and the sound of what comes back into the VS-2400CD from the external devices.
- create a mix to send to a house public address (PA) system when you're using the VS-2400CD for live recording in a club or concert hall.

What all of these jobs have in common is that all involve the same basic abilities in the mixer. The mixer lets you:

- control the level of all kinds of audio.
- set the audio's stereo or Surround positioning between your speakers.
- change the tonal characteristics of audio with equalization, or "EQ."
- apply dynamics processing to audio to change the way it gets louder or softer.

Bouncing, equalization, EQ, dynamics processing

MIDI Control Surface

When the VS-2400CD's V.Fader feature is active, you can use each channel strip's fader to send MIDI Control Change messages to an external MIDI device. This can be especially handy when you're using the VS-2400CD with a MIDI sequencer. You can use the mixer to work the sequencer's controls directly from the VS-2400CD. See "V.Fader—The VS-2400CD MIDI Control Surface" on Page 286 to learn more about using the mixer as a MIDI control surface.

The Internal Effects

What Are the Internal Effects?

The VS-2400CD contains a set of individual internal effects processors. As shipped from the factory, there are two internal stereo effect processors onboard. You can install another VS8F-2 Effect Expansion Board (purchased separately) for a total of four internal stereo effect processors.

What Are Effects?

An effect is a type of audio processing that's added to a sound to enhance it. There are a variety of effects available in the VS-2400CD, including:

- *Reverbs*—A reverb adds an ambience to a sound, creating the impression that it exists in an actual physical space. Some people call reverb "echo," though technically that word applies to something else, as we'll see. A reverb can be short in duration—so that it sounds like an average-sized room in your home—or long, so that it sounds like big concert hall. It can also be set to any size in-between.
- *Delays*—A delay causes the original sound to repeat one or more times, often at levels that get quieter and quieter with each repeat. Long delays help re-create classic rock 'n roll sounds. Any delay can also useful for subtly suggesting an ambience. Another word for "delay" is "echo."
- *Choruses, flangers and phasers*—All three effects add their own type of swirling texture to a sound, most often to instruments such as electric pianos and electric guitar or bass. They utilize subtle delays and/or pitch changes to do what they do.
- *Filters*—A filter removes part of the original sound. This group of effects includes EQs and things like wah-wah pedal simulations.
- *Compressors, limiters, gates*—These effects, collectively called "dynamics processors," alter the volume of the original signal in one way or another. Compressors and limiters even out volume fluctuations, while a gate lowers the level of a signal—or shuts it off altogether—when it falls below a certain volume level.
- *Modeling*—Roland's COSM™ (Composite Object Sound Modeling) process emulates various guitar amps, microphones and speakers with amazing realism.

The VS-2400CD also offers effects that use several of these audio processes at once.

How Does the VS-2400CD Create Effects?

Each of the VS-2400CD's effects is created by subjecting an audio signal—remember, it's just numbers while it's inside the VS-2400CD—to a complex mathematical formula called an "algorithm." The VS-2400CD contains 36 algorithms. You'll find a list of them in the *VS-2400CD Appendices* booklet.

Each algorithm has its own collection of settings. You can save an algorithm's settings in the VS-2400CD memory as an "effect patch." The VS-2400CD ships from the factory with 250 pre-programmed patches, many of which offer more than one kind of effect. The VS-2400CD also provides 200 memory locations into which you can save your own effect patches. See the *VS-2400CD Appendices* for a list of the factory effect patches.

Effects can be applied to an audio signal in either of two ways, as we'll discuss in Chapter 5, starting on Page 79.

The Hard Disk Recorder

The VS-2400CD’s hard disk recorder is the simplest of its three major components to explain and understand—it’s an audio recorder, acting a lot like a cassette recorder, VCR or any other traditional kind of recorder. Its basic controls will be familiar to you. Instead of recording on a cassette or VHS tape, however, the hard disk recorder records audio onto a computer hard disk drive (Page 83). This provides some important advantages over other kinds of recorders:

- Its sound quality is excellent.
- You can instantly jump to any location in a recording with no waiting while the machine fast-forwards or rewinds.
- You can easily manipulate recorded audio, copying it, pasting it, moving it, time-stretching it and much more.
- You can edit audio “non-destructively,” with the ability to undo any edit you make.
- The VS-2400CD can memorize multiple locations within a recording so that you can jump back and forth between sections in a heartbeat.

How Many Tracks Can It Record?

The hard disk recorder can record up to 16 tracks at once, and play back up to 24 tracks at a time. That’s really only the beginning of the story—each project on the VS-2400CD can actually contain *384* “Virtual Tracks” from which you can pick and choose.

The words “track” and “Virtual Track” have special meanings in the VS-2400CD. We’ll discuss them in Chapter 6.

The number of tracks you can record and play at once is determined by the selected recording mode, as you’ll learn in Chapter 7.

We’ll discuss how to use the hard disk recorder in Chapter 13, starting on Page 171.

Output Jacks and Connectors

You can burn your own audio CDs directly from the VS-2400CD using its built-in CD-RW drive. However, there are lots of reasons you might want to get audio out of the VS-2400CD. You may want to:

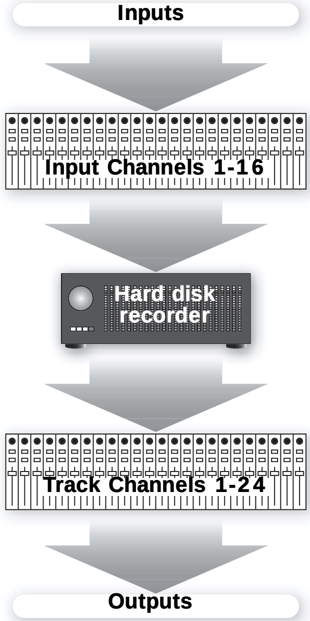
- send your MASTER mix to a pair of monitors so you can hear what you’re doing.
- send input signals or tracks to an external effect processor.
- send tracks to a computer for further editing or other purposes.
- send signals to a headphone amplifier to give your performers a way to hear what’s being recorded during a recording session.
- send signals to a stage monitors to let your performers hear what they’re playing or singing when using the VS-2400CD for live recording.

The VS-2400CD provides analog output jacks and digital connectors for all of these situations. We’ll discuss them in detail in Chapter 21, starting on Page 271.

Burn

Signal Flow

Here's an illustration that shows how signals typically flow in the VS-2400CD. You can see how the inputs, input channels, hard disk recorder, track channels and outputs work together:



There are several places at which you can add effects to signals—the effects processor isn't shown in this illustration for visual clarity.

Projects

Everything you do in the VS-2400CD takes place inside something called a "project." As its name suggests, a project is a hard disk file that contains all of the information for a particular work or performance you're creating. That work could be a song, a soundtrack, a broadcast, a jingle or anything else. It could even be the music for an entire CD, containing multiple songs, or a set of songs recorded live.

In some other V-Studios—such as the VS-1880, VS-890, VSR-880 and VS-840GX—projects are called "songs."

Projects provide an easy way to keep all the materials for a particular piece in one place, ready to go when you need them, including:

- everything you've recorded.
- your most recent mixer settings, as well as any alternate mixer setups you've saved.
- your effect settings.
- all locations you've saved for use in navigation, punching and looping.
- all Automix data.
- playback speed settings.
- all information relating to tempo and synchronization.
- all project-related UTILITY menu settings.

The VS-2400CD *always* has a project loaded, even if you've never created one yourself.

A project can be as large as space allows, as long as it doesn't exceed the maximum number of allowable events (see below.) You can save up to 200 projects on your hard drive, space permitting. You can change from project to project by loading the project you want to work on as needed. You can also copy data between projects. Project operations are discussed in Chapter 7 on Page 89. That's where we'll describe how to create and name a new project.

If the intended final destination for your project is an audio CD, be sure to select a 44.1kHz sampling rate for your project when you create it—see Page 329.

About Events

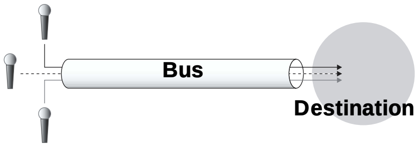
The smallest chunk of project data that the VS-2400CD works with is called an "event," a piece of information that the VS-2400CD needs to do its job. For example, each recording you make uses up at least two events: one that tells the VS-2400CD where on the hard drive the recording's file starts, and one that tells it where it ends. Each project can contain roughly 30,000 events—when all of its events have been used up, the project is full, even if you have disk space left. You can trim the number of events in a project by "optimizing" it, as discussed in Chapter 7.

Busses in the VS-2400CD

In order to get signals from one place to another within the VS-2400CD—and to provide a way to get them out of the VS-2400CD—the VS-2400CD uses a set of "busses." While we'll describe the use of the VS-2400CD's busses in various places throughout the *VS-2400CD Owner's Manual*, it's important to first understand what a bus is.

What's a Bus?

A bus is a pathway down which one or more signals can travel to a common destination.



In older analog mixers, a bus was literally a single wire into which signals were fed—the wire was then connected to the desired destination's input.

This simple mechanism is more significant than it may seem since it lets you send a group of signals to a track, into a mix, to an effect, to specific outputs and more. Much of the VS-2400CD's bussing occurs behind the scenes—so you won't always be dealing directly with it—but some of its busses play an important, visible role in its operations.

Although every bus is essentially the same thing—a pathway—busses are named for the type of signal they typically carry. The VS-2400CD provides the following busses.

Type of bus:	*What it does:*
RECORD	Each of these 24 busses carries signals to one of the hard disk recorder's tracks.
MASTER	This stereo left/right pair of busses carries the VS-2400CD's main stereo mix to any number of possible destinations.
MONITOR	This stereo left/right pair of busses carries signals to your listening device: monitor speakers or headphones
AUX	"AUX" is short for "Auxiliary Send." The eight AUX busses carry signals to the VS-2400CD's internal effects. They can also carry signals to outputs connected to external devices such as effect boxes or headphone amplifiers for your performers.

Don't be confused by the name "R-*BUS*." R-BUS isn't a kind of bus—it's Roland's own digital connector format. Of course, you can route some of the VS-2400CD's busses *to* the VS-2400CD's R-BUS connector (Page 272) to send them to an external digital device.

About Direct Paths

There's another type of pathway available in the VS-2400CD called a Direct path, or "DIR" for short. Unlike a bus, a Direct path can only carry one signal at a time. Each of the eight Direct paths is handy for routing a single signal to an internal effect or to an output on its way to an external device. See "Direct Paths" on Page 202.

Achieving Perfect Levels

In all digital recording, the best sound is achieved when a signal is at *just* below 0 dB in level so that the audio takes fullest advantage of the recording device's available bit depth. You need to be careful, though: If the signal exceeds 0 dB, the signal will "clip."

Bit depth

What's "Clipping?"

Clipping is the introduction of clicking and other noises when a signal's too loud. There's no really good way to get rid of these noises once they've been recorded. You may have some success importing the audio into a wave editor with de-clicking tools, but it's best to avoid clipping in the first place.

How Do I Get Good Levels?

The goal, therefore, is to capture as loud a signal as possible without exceeding 0 dB. Achieving a loud-but-not-too-loud signal is the challenge of digital recording. When your audio that has a consistent, predictable dynamic range, it's not hard to accomplish. However, if your project swings wildly between loud and soft passages—or if you're recording musicians whose volume changes a lot—it can be more tricky.

Take Care During Recording

When it comes to establishing great levels, the most critical stage is during the original recording process. The most difficult recording situations involve the recording of musicians whose levels fluctuate between one performance and another, or even within the same performance—it can be hard to capture a strong level if you can't be sure how loud the performance is going to get. Fortunately, the VS-2400CD provides some peak-detection options that can help you anticipate potential level problems (Page 122). It also offers tools you can use to smooth out a signal.

If you're finding a performer's level just too erratic to manage, consider running the signal through an external compressor/limiter that can smooth out some of the volume fluctuations in the performance before it even gets to the VS-2400CD. Try to find an acceptable trade-off between making the signal manageable on one hand, and not removing expressive dynamics from the signal on the other.

Compressor, limiter

The level of a digital input signal is normally controlled at its source, the external digital device that produces it.

Watch the Meters

The VS-2400CD provides meters that let you view your signal levels at every stage in the project-creation process. The VS-2400CD's various meters are described in detail in Chapter 8, which starts on Page 115.

As you work on your project, pay close attention to your levels:

- Watch the input channel meters during recording—they set the levels of signals as they're recorded onto your tracks.
- Watch your Aux bus levels if you're using them to send signals to the internal effects or external devices.
- Watch your Direct path levels if you're using them to send signals to external devices or the internal effects.
- During mixing, watch:
    - *your track levels*—if they're too loud, bring them down and raise your MASTER fader setting.
    - *your MASTER bus levels*—this is the mix's overall level.
- Watch your output meters if you're sending signals to external devices.

The Importance of Backing Up

It's a simple fact of life that even the most reliable computers and their hard drives can misbehave—everyone who owns a computer knows this. Outside events—such as power outages and spikes—can also cause problems to occur.

The VS-2400CD is a highly specialized computer designed for recording, but it *is* a computer, and all of your data is stored on its hard drive. As such, it's subject to the same mishaps as any other computer. While your VS-2400CD is very trustworthy, there can be no absolute guarantee that nothing will ever go wrong.

It's vitally important, therefore, that you do what every computer user must do: regularly back up your data. If an unexpected problem does occur, you can always re-load your backed-up data and carry on.

Your built-in CD-R/RW drive provides a perfect way to easily and quickly back up your data on inexpensive CD-R ("CD-Recordable") or CD-RW ("CD-ReWritable") disks that can hold large amounts of data. The VS-2400CD provides extensive backup and recovery tools, as described in Chapter 7.

While backing up your data requires an investment of your time on a regular basis, there's no substitute for the peace of mind it provides, especially if something does go wrong. Backing up your project is the best way to ensure that all of your inspired moments and hard work remain completely safe and sound, no matter what happens.

4—Setting Up and Basic Operations

Things You'll Need

Power

You'll need a standard AC power socket that supplies grounded AC power. If you're going to listen to the VS-2400CD through speakers, you'll also need power for them and for their amplifier if it's a separate component.

A Way to Listen to the VS-2400CD

You can listen to—or "monitor"—the VS-2400CD through speakers or by connecting standard stereo headphones to the VS-2400CD's PHONES jack.

For speakers, we recommend Roland's DS-90A or DS-50A Digital Reference Monitors (purchased separately). There are several reasons:

- They have ultra-flat frequency responses. It's critical that your speakers tell you the truth as you work so you know what your recordings really sound like. The DS-90As and DS-50As tell the truth.
- The DS-90As and DS-50As are powered monitors, meaning that they have their own built-in amplifiers that are perfectly matched to the speakers.
- They have optical and coaxial digital inputs so that you can connect them to the VS-2400CD digitally and avoid noise that may occur with analog wiring.
- They can take advantage of Roland's advanced COSM Speaker Modeling that lets you try out your work on a variety of virtual speaker models. The VS-2400CD's built-in speaker models eliminate the difficulty of making sure your recordings sound good on any speaker system.

A Headphone Note

The VS-2400CD's PHONES jack is a 1/4" stereo phone-type jack, so you'll need to make sure that the headphones you use have a 1/4" stereo phone-type plug. If your headphones have some other type of plug, you'll need to purchase an adapter for them.

Getting Ready

Turn Everything Off, Turn Everything Down

In order to prevent any unpleasant surprises or damage to your monitoring equipment, you should turn off all of your equipment—the VS-2400CD, monitors, etc.—before making your connections. In addition, you should turn down all of the appropriate volume controls before powering up your system:

- If you're using a speaker amplifier, turn its gain control down all the way.
- On the VS-2400CD, turn down the MONITOR knob to the left of the display all the way. If you're going to connect headphones to the PHONES jack, turn down the PHONES knob all the way as well.

Connect a PS/2 Mouse and PS/2 ASCII Keyboard

A mouse and ASCII keyboard can make operation of the VS-2400CD even easier. The VS-2400CD supports the use of a PS/2-type mouse and PS/2 keyboard. A PS/2 mouse is included with your VS-2400CD. A PS/2 keyboard must be purchased separately.

Many of the VS-2400CD's operations can be performed using a mouse instead of the VS-2400CD's top-panel controls, as described on Page 68. A mouse also allows you to operate the VS-2400CD from the screen of a connected VGA monitor purchased separately)—see Page 379. You can a range of operations—and navigate the VS-2400CD—using a connected ASCII keyboard (Page 70).

Connect the included mouse to the rear-panel PS/2 MOUSE jack. Connect your keyboard to the PS/2 KEYBOARD jack.

You may need to activate your ASCII keyboard. See the keyboard settings on Page 64.

Connect a VGA Monitor

When you connect a color VGA monitor (purchased separately) to your VS-2400CD, your VS-2400CD is even easier to use. By manipulating its controls onscreen using your mouse, everything becomes a simple matter of pointing and clicking. You can use the VGA as your main display and the VS-2400CD's internal LCD as a supplemental Info Display, or the other way around. See Chapter 29, starting on Page 379 to learn more.

You can use any standard VGA display that has a refresh rate from 60-75 Hz. Connect your monitor's DB-15-type VGA cable to the VS-2400CD's rear-panel VGA OUT jack.

Connect Monitors or Headphones

The connections you'll make depend on how you'll be listening to the VS-2400CD:

- If you're going to be listening to the VS-2400CD through DS-90A or DS-50A monitors, you can connect the VS-2400CD's COAXIAL OUT or its OPTICAL OUT to the monitors' COAXIAL or OPTICAL DIGITAL INPUT. Make sure the DS-90's or DS-50A's Digital Input Select Switch is set to the type of digital connection you've decided to use, and that its Input Select Switch is set to DIGITAL INPUT. See your *DS-90A* or *DS-50A Owner's Manual* for more information.

When using one of the VS-2400CD's DIGITAL OUTs for monitoring, you'll need to configure them as described in "If You're Using DS-Series Monitors" on Page 73.

- If you're using other monitors, connect the VS-2400CD's ANALOG MULTI OUTPUTs 7 and 8 to the left and right inputs, respectively, of your speaker system.
- If you're using headphones, connect them to the PHONES jack.

Connect All Other Devices

Connect any other devices to the appropriate VS-2400CD jacks or connectors. If you're unsure which jack or connector to use, consult the device's documentation.

Making Power Connections

Connect one end of the supplied AC power cable to a grounded AC outlet, and the other to the VS-2400CD's AC IN jack—use *only* the supplied AC cable. Connect all other devices' power cables as recommended in their documentation.

Powering Up

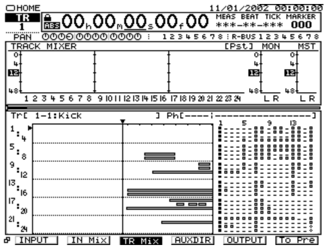
It's important that you power up the VS-2400CD and any equipment to which it's attached in the following order to prevent damage to your equipment and to make sure the VS-2400CD recognizes everything you've connected to it.

Once the connections have been completed (Page 64), turn on power to your various devices in the order specified. By turning on devices in the wrong order, you risk causing a malfunction and/or damage to speakers and other devices.

This unit is equipped with a protection circuit. A brief interval after power up is required before the unit will operate normally.

In the following steps, allow each piece of equipment to finish its power-up sequence before proceeding to the next step.

1. Turn on everything connected to the VS-2400CD except your monitors or monitoring system. This includes devices connected to the VS-2400CD via analog connections or digitally and your VGA monitor.
2. Turn on the VS-2400CD by pressing its rear-panel POWER switch to its On position. When the Home display—shown here—appears, the VS-2400CD power-up sequence is complete.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PAN
1 2 3 4 5 6 7 8
R-BUS 1 2 3 4 5 6 7 8
TRACK MIXER
[Pst] MON MST
0
4
12
48
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
L R
L R
Tr[1-1:Kick] Ph[----¦----------------]
1 5 9 13
1 4
5 8
9 12
13 16
17 20
21 24
INPUT
IN Mix
TR Mix
AUXDIR
OUTPUT
To Pre

This takes a few moments, as explained in the next section.

3. Turn on your monitor speakers or monitoring system.

What Happens During the VS-2400CD's Power-Up

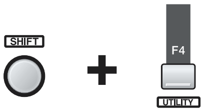
When you turn the VS-2400CD on, it performs a few important tasks that help ensure its successful operation. It:

- performs some diagnostic routines to make sure everything's working properly.
- sets up the available effects.
- re-loads the project that was loaded at power-down. (When you turn on the VS-2400CD for the first time, this is the "Chemistry" demo.) As a project loads, the faders move to their last-saved positions and the project's settings are restored.

Configuring the VS-2400CD

Setting Up the VGA Monitor, Mouse and Keyboard

This section describes how to set up your mouse, keyboard and VGA monitor. Their settings are found in the UTILITY menu. To get there:



1. Hold down SHIFT and press F4•UTILITY under the display.
2. Press PAGE—if necessary—until "SYSTEM" appears above F1.
3. Press F1 (SYSTEM) beneath the display.
4. Press F2 (Param2) to display the VGA settings, and then F3 (Param3) to display the mouse and keyboard settings.
5. Use the ◀ , ▶ , ▲ and ▼ buttons as necessary to select each setting—a setting's outline darkens when it's selected—and turn the Time/Value dial to choose the desired value.

If you don't have a VGA monitor or keyboard, skip over its parameters.

VGA Monitor Parameters

Parameter:	*What it sets:*	*Typical setting is:*
VGA OUT	Turns the VGA output on or off	On
REFRESH RATE	Sets the rate at which the monitor re-draws it image	Manufacturer's recommended setting
H. POSITION	Shifts the image left or right	0
V. POSITION	Shifts the image up or down	0
OPERATION TARGET	Designates the internal LCD or a connected VGA monitor as the main operation display	*see Page 379*

Consult your VGA monitor's documentation for its recommended refresh rate to avoid poor image quality and possible damage to the monitor.

The VGA parameters are described in greater detail on Page 353.

Mouse Parameters

Parameter:	*What it sets:*	*Typical setting is:*
PS/2 MOUSE	Turns the mouse on or off	On
POINTER SPEED	Sets how fast the mouse's cursor moves	3
MOUSE BUTTON SWAP Sw	Sets the right- or left-handedness of the mouse	(*see Page 68*)

ASCII Keyboard Parameters

Parameter:	*What it sets:*	*Typical setting is:*
PS/2 KEYBOARD	Turns the keyboard on or off	On
KEYBOARD TYPE	Selects the nationality of the ASCII keyboard you're using	101/104 (in USA); 106/109 (Japan)

Setting the VS-2400CD's Clock

The VS-2400CD time-stamps your recordings to make it easier for you to keep track of your work. Before it can do this, you'll need to set its clock.

1. Hold down SHIFT and press F4•UTILITY.
2. Press the PAGE button repeatedly—if necessary—until "DATE" appears above F5.
3. Press F5 (DATE). The DATE/TIME screen appears.
4. If the DATE parameter isn't selected, use the ◀, ▶, ▲ and ▼ buttons to select it.
5. If the month isn't already selected, press ◀ to select it.
6. Turn the Time/Value dial until the current month is displayed.
7. Press ▶ and turn the Time/Value dial to choose today's date.
8. Press ▶ and turn the Time/Value dial to choose the current year.
9. Press ▶ and turn the Time/Value dial to choose the desired DATE FORMAT setting. Dates can be shown on the display in any of the following styles:

This value:	*Displays dates as:*
mm/dd/yyyy	07/12/2001
dd/mm/yyyy	12/07/2001
yyyy/mm/dd	2001/07/12
MMM.dd 'YY	Jul. 12, '01
dd MMM 'YY	12 Jul '01

10. Press ▼ to select the TIME parameter.
11. Turn the Time/Value dial to select the current hour.

The VS-2400CD uses 24-hour time: Midnight is Hour 00, 1 am is 01, and 1 pm is Hour 13.

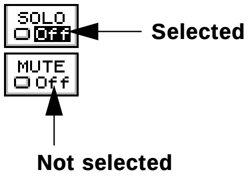
12. Press ▶ and turn the Time/Value dial to select the minute, and then second.
13. Press F5 (SET) to confirm your changes.
14. Press F6 (EXIT) to leave the DATE/TIME screen and finish the procedure.

A Few Fundamental Concepts

Selection

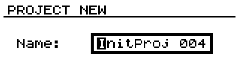
Before you can change something in the VS-2400CD, you must first select it. In the case of physical controls, it's obvious: before you can move a fader, you've got to grab it with your fingers. This rule also applies to items shown on the VS-2400CD's display. When you select something on the display, you're telling the VS-2400CD you want to do something to the thing you've selected. The two most common ways to make a selection are to use the cursor buttons or to click the desired item with your mouse. Once you've made a selection, you can make the desired change using the appropriate tool.

When you select one displayed item and then another, you're moving the "selection cursor."



The VS-2400CD shows you what's currently selected. Often, the selected item becomes "highlighted"—its colors are inverted. Text, for example, becomes white with a dark background.

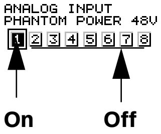
When you select a box in which you can enter data or choose a different value, the box's outline becomes darkened.



PROJECT NEW

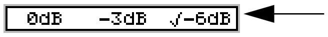
Name: InitProj 004

Switches



Some settings in the VS-2400CD are presented as switches. They're typically shown in either of two ways:

- *As a box*—when a switch is on, it's darkened. When it's off, it's not.
- *As checked items*—when a value is checked, it's on. If it's not, it's off.



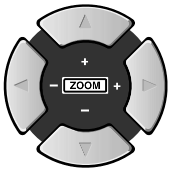
In this illustration, the -6 dB value is turned on.

Parameters and Values

Up until now in this manual, we've been using the word "setting" to describe something you can adjust. The correct term is actually "parameter," the word we'll use from here on (except in a few cases where "setting" is clearer). When you adjust a parameter, what you change is its "value." You can set a parameter with the cursor buttons—see below—and Time/Value dial, or by using your mouse (Page 68).

Tools You'll Use All the Time

The Cursor/ZOOM Buttons



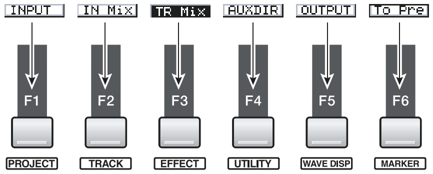
Most of the time, you can navigate to the desired parameter on the display by pressing the ◀, ▶, ▲ and ▼ cursor/ZOOM buttons. When you press any of these buttons, you'll see the selection cursor move in the direction of the arrow button you've pressed.

By holding down SHIFT and pressing the ◀, ▶, ▲ and ▼ buttons, you can zoom in or out on track displays. See Page 45.

If you've connected an ASCII keyboard to the VS-2400CD, you can often use its arrow keys instead of the ◀, ▶, ▲ or ▼ buttons.

The F Buttons

In all of the VS-2400CD's operations, the LCD display provides information and visual feedback about what you're doing. Parameters, on/off switches and more appear on the display. Often, boxes appear at the bottom of the display—each of these boxes shows the current function of the F button directly beneath it.

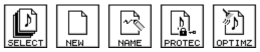


If there's nothing on the display above an F button, it's currently inactive.

You can always use the F1-F6 buttons on a connected ASCII keyboard instead of the F buttons beneath the VS-2400CD's display if you wish.

When the boxes at the bottom of the screen are small rectangles, the F buttons usually:

- display the parameters associated with an operation.
- execute an operation.
- act as on/off switches.
- change the value of the associated parameter.
- move the selection cursor to a location on the display.
- exit the current screen.

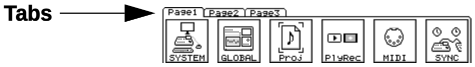


Sometimes the boxes at the bottom of the screen are large and contain icons. When this is the case, you can press the corresponding F button to begin an operation or view a menu of related parameters.

In all cases, the label on the display above the F button tells you what the button does.

Pages

Often, there are more parameters available than can fit on the display at once. In these cases, the parameters are arranged over several "pages" on the display. In such situations, you see the Page symbol in the lower left-hand corner of the display—the display may also show what look like folder tabs, presenting the available pages as tabbed layers.



Press the PAGE button repeatedly to display each of the available pages.

If you've connected an ASCII keyboard to the VS-2400CD, you can press its Tab key instead of the VS-2400CD's PAGE button.

Param 1, 2, 3 Screens

In some VS-2400CD menus, parameter pages are divided further into sub-pages called "Param1," "Param2," etc. You can select one of these sub-pages by pressing its F button.

The Time/Value Dial

Once you've selected a parameter you want to edit, you can turn the large, black Time/Value dial to change the parameter's value.

When you're adjusting parameter values with the Time/Value dial, hold down SHIFT as you turn the dial to move through the available values by different-sized increments.

You can change your current time location in a project using the Time/Value dial (see Page 123).

The ENTER/YES and EXIT/NO Buttons

ENTER
/ YES
EXIT
/ NO

Use the ENTER/YES or EXIT/NO buttons beneath the to execute or cancel the current operation, or to respond to a question posed on the display.

You can tell the ENTER/YES button from the EXIT/NO simply by touch—ENTER/YES is larger.

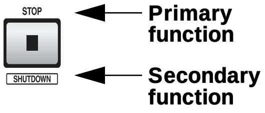
The ENTER/YES and EXIT NO buttons blink to signify that you can press the:

- ENTER/YES button to finish, or press EXIT/NO to cancel, the current operation.
- ENTER/YES to answer “yes” to a displayed question, or EXIT/NO to reply “no.”

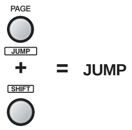
The ENTER/YES button also blinks to indicate that you can press it to view additional options. EXIT/NO flashes at times to show you can press it to exit the current screen.

If you prefer, you can always use the Enter key on your keyboard instead of ENTER/ YES, or the Esc key instead of EXIT/NO.

The SHIFT Button



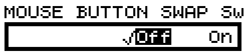
Many of the VS-2400CD’s buttons perform more than one job—these buttons often have an upper label and a lower label that’s printed inside an outline box. The un-boxed label shows the button’s primary function, the boxed label its secondary use.



To cause a button to perform its secondary job, hold down SHIFT and press the button before letting go SHIFT.

You can set the SHIFT button so that it toggles on and off with each touch to cut down on SHIFT-button presses. See “SHIFT LOCK” on Page 355.

Using a Mouse



MOUSE BUTTON SWAP Sw
√Off On

The VS-2400CD uses a two-button mouse that can be set up for right-handed or left-handed users, according to the setting of the MOUSE BUTTON SWAP Sw System parameter in the VS-2400CD’s UTILITY menu. When the parameter’s turned:

- *off*—the mouse operates as a right-handed mouse. The left button clicks and the right button displays pop-up menus.
- *on*—the mouse operates as a left-handed mouse. The right button clicks and the left button displays pop-up menus.

When the *Owner’s Manual* says to “click” the mouse, right-handed users should click the left-hand button. When it says to “right-click,” they should click the right-hand button. If you’re a left-handed mouse user, you’ll need to mentally reverse these instructions—”click” the right-hand button and “right-click” the left-hand button.

Mouse Cursors

The cursor changes to show you what the mouse can do as you move it over different items on the display.

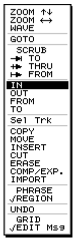
This cursor:	*Means that the mouse:*
↖	is moving between items on the display. On the Home screen, you can click on a track to select it.
☝	can click on the item beneath the cursor. If it's a switch, you can toggle through its values by repeatedly clicking. If it's an adjustable parameter, you'll see either of the next two cursors after you click.
↕	can raise or lower the parameter's value as you drag the mouse up or down, respectively.
↔	can raise or lower a parameter's value as you drag the mouse right or left, respectively.
✋	can drag the data beneath it during editing operations.
✊	is ready to move whatever's beneath the mouse to a new location.
+✊	is ready to copy whatever's beneath the mouse by dragging; this appears when SHIFT is held down during track editing.
+[+	is ready to trim the start of a phrase during track editing.
+]+	is ready to trim the end of a phrase during track editing.

There are several additional cursors that appear momentarily during track editing, as described on Page 244.

When a parameter's values are presented in a list or in a box, you can simply click the desired value with your mouse without having to select the parameter first.

Pop-Up Menus

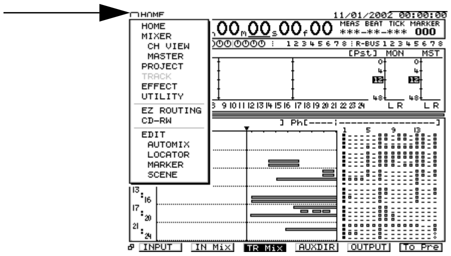
When a pop-up menu is available, you can select an item in the menu by dragging the mouse to it—so the item's highlighted—and then click the left mouse button to select it. The following two pop-up menus are available from a number of screens.


ZOOM ↑↓
ZOOM ↔
WAVE
GOTO
SCRUB
TO
THRU
FROM
IN
OUT
FROM
TO
Sel Trk
COPY
MOVE
INSERT
CUT
ERASE
COMP/EXP.
IMPORT
PHRASE
√REGION
UNDO
GRID
√EDIT Msg

Drag to the desired menu item and click.

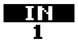
Display Pop-Up Menu

You can quickly jump to some of the VS-2400CD's most important screens by clicking on the small rectangle in the upper left-hand corner of many of the VS-2400CD's screens.

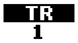

HOME
11/01/2002 00:00:00
HOME
MIXER
CH VIEW
MASTER
PROJECT
TRACK
EFFECT
UTILITY
EZ ROUTING
CD-RW
EDIT
AUTOMIX
LOCATOR
MARKER
SCENE
MEAS BEAT TICK MARKER
-**- 000
R-BUS
[Pst] MON MST
INPUT
IN Mix
TR Mix
AUXDIR
OUTPUT
To Pre

Channel Pop-Up Menu

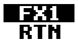
If you're using a mouse, you can also select a new input, track or FX return channel from any screen on which the currently selected channel's number is displayed as shown here.



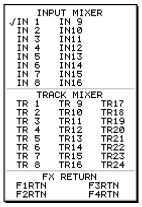
Input channel



Track channel



FX return channel


INPUT MIXER
√IN 1 IN 9
IN 2 IN10
IN 3 IN11
IN 4 IN12
IN 5 IN13
IN 6 IN14
IN 7 IN15
IN 8 IN16
TRACK MIXER
TR 1 TR 9 TR17
TR 2 TR10 TR18
TR 3 TR11 TR19
TR 4 TR12 TR20
TR 5 TR13 TR21
TR 6 TR14 TR22
TR 7 TR15 TR23
TR 8 TR16 TR24
FX RETURN
F1RTN F3RTN
F2RTN F4RTN

To select a new channel:

1. Click the channel number. The Channel Pop-Up menu appears.
2. Move the cursor to the desired channel and click.

Using an ASCII Keyboard

After you've connect an ASCII keyboard to the PS/2 KEYBOARD jack, and activated it (Page 64), you can use the keyboard to perform the following actions.

What You Can Do With an ASCII Keyboard

You can use the keyboard's:	*To:*
Letter and number keys	enter names for projects, tracks, scenes, locators, etc.
Space bar	start, stop and continue project playback
Arrow keys	move the cursor on the VS-2400CD's display
SHIFT+arrow keys	zoom in and out vertically and horizontally
Home	display the Home screen
F7	display the EZ Routing VIEW screen
SHIFT+F7	display the EZ Routing P.BAY screen
SHIFT+F8	display Mastering Room screen
Ctrl+S	store the current project
Ctrl+Alt+Delete	shut down the VS-2400CD

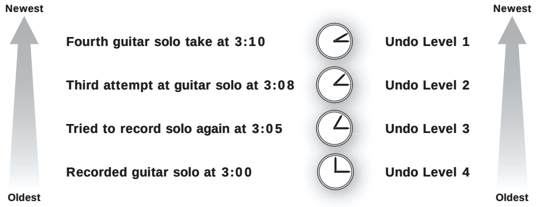
And the keyboard's:	*Acts as the VS-2400CD's:*
F1-F6	F1-F6 buttons
Tab	the PAGE button
Enter	the ENTER/YES button or left mouse button
Esc	the EXIT/NO button
F9	the PROJECT MENU button
F10	the TRACK MENU button
F11	the EFFECT MENU button
F12	the UTILITY MENU button

UNDO and REDO

Undo

The Undo function allows you to reverse—or "undo"—track recording and editing operations. Each project remembers up to 999 of your most recent recording and editing actions and can restore the project to the state it was in before each action.

Each action is assigned a numbered "Undo level." The lower the number of the level, the more recent the action. All undoable actions in a project appear in the Undo list along with the date and time of each action.

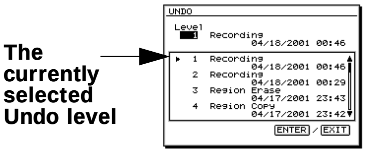

Newest
Fourth guitar solo take at 3:10
Third attempt at guitar solo at 3:08
Tried to record solo again at 3:05
Recorded guitar solo at 3:00
Oldest
Newest
Undo Level 1
Undo Level 2
Undo Level 3
Undo Level 4
Oldest

When you undo a recording or editing operation, everything you did after the operation originally took place is also undone.

Undo affects track recording and editing operations only—it doesn't undo parameter value changes.

If a project contains data required for undoing actions you're sure you'll never need to undo, you can perform a project optimization to discard the unwanted data and reduce the size of the project and the space it takes up on your hard disk. See Page 96.

Undoing a Track Recording or Editing Operation



```
UNDO
Level
  1  Recording
            04/18/2001 00:46
▸ 1  Recording
            04/18/2001 00:46
  2  Recording
            04/18/2001 00:29
  3  Region Erase
            04/17/2001 23:43
  4  Region Copy
            04/17/2001 23:42
```

1. Press UNDO•REDO.
2. Locate the desired action in the Undo list.
3. Turn the TIME VALUE dial to select the desired Undo level—the selected level has an arrow to its left.
4. Press ENTER/YES. The selected action—and all other recording and editing actions that took place after it—is undone.

After the Undo operation is complete, the UNDO•REDO button remains lit to indicate that you can cancel the Undo operation by performing a Redo.

You can set the UTILITY menu's UNDO MESSAGE parameter so that when you press UNDO, the VS-2400CD instantly reverses the last operation without displaying the Undo list—see Page 356.

Redo

If you change your mind about an action—or series of actions—you've undone, you can perform a "Redo" while the UNDO•REDO button is lit. To do this, hold down SHIFT and press UNDO•REDO. When the Redo dialog appears, press ENTER/YES.

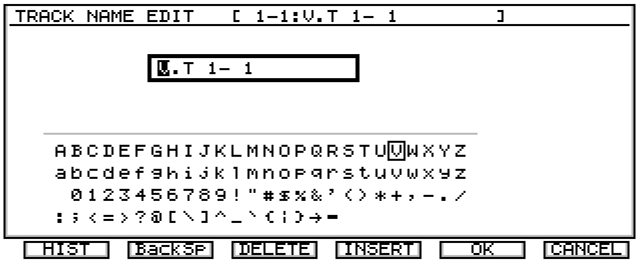
The ability to perform a Redo operation lasts only until you next save the project.

Naming

You can assign names to a wide range of things in the VS-2400CD, such as:

- projects (Page 95)
- phrases (Page 257)
- markers (Page 184)
- tracks (Page 270)
- effect patches (Page 219)
- scenes (Page 139)
- takes (Page 259)
- locators (Page 180)
- routing templates (Page 282)

The pages in the previous list provide details about how to access each item's naming screen. The procedure you'll use is the same no matter what it is you're naming, and all of the naming screens look alike, as in the following illustration.


TRACK NAME EDIT [1-1:V.T 1- 1]
V.T 1- 1
ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
0123456789!"#$%&'()*+,-./
:;<=>?@[\]^_`{|}→←
HIST
BackSp
DELETE
INSERT
OK
CANCEL

The project-naming screen provides some additional elements, including information about the project and an area into which you can enter comments about the project.

Entering a New Name Using the VS-2400CD Controls

1. Press ◀ to select the first character in the naming box if it isn't already selected.
2. Turn the Time/Value dial to select the desired first character—a box appears around the currently selected character in the area below the naming box.
3. Press ▶ to select the next character.
4. Turn the Time/Value dial to select the second character in the new name.
5. Repeat Steps 3 and 4 until you've entered the entire new name.
6. When you're done, press F5 (OK).

Entering a New Name from a Keyboard

1. Press ◀ to select the first character in the naming box if it isn't already selected.
2. Type the desired name.
3. Press F5 (OK).

Naming Tools

The F buttons beneath the naming screen provide tools you may want to use as you create a name.

Press:	*To:*
F1 (HIST)	recall with each press one of the names you've entered since powering up.
F2 (BackSp)	delete the character to the left of the currently selected character.
F3 (DELETE)	erase the currently selected character and move all following characters to the left by one position.
F4 (INSERT)	add a blank space before the currently selected character, moving all following characters one position to the right.
F5 (OK)	assign the currently entered text to the item you're naming.
F6 (CANCEL)	leave the naming screen without assigning a new name.

Entering Numbers with the Numeric Keypad

In parameter boxes that contain project time locations, you can enter the desired number using the VS-2400CD numeric keypad. To do this:

1. Press NUMERICS. It lights—and ENTER/YES and EXIT/NO flash—to indicate that the keypad is active.
2. Press ◀ or ▶ to select the part of the number you want to enter.

If you're entering a long string of numbers, select the right-most digit on the display—each number you enter from the keypad pushes the displayed numbers to the left.

You can set the VS-2400CD so that numbers are entered from the keypad right-to-left (the default method) or left-to-right. See "NUMERICS TYPE" on Page 356.

3. Enter the desired value by pressing the appropriate keys on the keypad.

- When you've finished entering the number, press ENTER/YES.

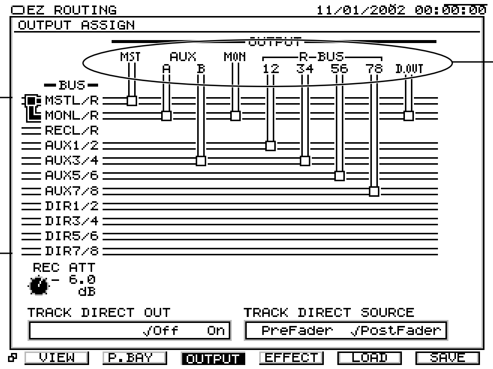
To enter "-" using the keypad, press "0" twice.

If You're Using DS-Series Monitors

If you're using Roland DS-90A or DS-50A Digital Reference Monitors, you'll need to route the MONITOR bus to the digital output to which you're connecting the monitors. (In the factory demo songs, this has already been taken care of.) When you create a new project, however, the MASTER stereo mix, not the stereo MONITOR bus, is routed to the OPTICAL and COAXIAL OUT connectors.)

Setting Up for Roland's DS-Series Digital Monitors

1. Press EZ ROUTING•PATCHBAY.
2. Press F3 (OUTPUT). The OUTPUT ASSIGN screen appears. On this screen, you can change the signal routed to each output jack and connector.


EZ ROUTING
11/01/2002 00:00:00
OUTPUT ASSIGN
OUTPUT
MST
AUX
MON
R-BUS
A
B
12
34
56
78
D.OUT
BUS
MSTL/R
MONL/R
RECL/R
AUX1/2
AUX3/4
AUX5/6
AUX7/8
DIR1/2
DIR3/4
DIR5/6
DIR7/8
VIEW
P.BAY
OUTPUT
EFFECT
LOAD
SAVE

REC ATT - 6.0 dB

TRACK DIRECT OUT √Off On

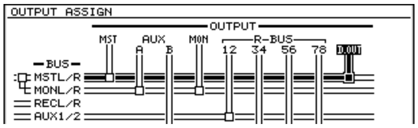
TRACK DIRECT SOURCE PreFader √PostFader

Along the left edge of the screen, you see all of the VS-2400CD's busses and the Direct paths (Page 57).

All VS-2400CD output jacks and connectors.

Each bus runs from left to right across the display. When you select an output and turn the Time/Value dial, a connection box moves down the screen to reach the desired bus.

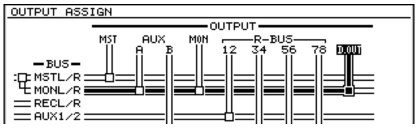
3. Press ▶ until the digital output you want to connect to your monitors is selected in the top row—in this screenshot, we've chosen the currently active digital output:


OUTPUT ASSIGN
OUTPUT
MST
AUX
MON
R-BUS
A
B
12
34
56
78
D.OUT
BUS
MSTL/R
MONL/R
RECL/R
AUX1/2

You can activate either the coaxial or optical digital connectors, as described on Page 127.

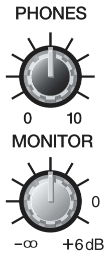
The thick black line—think of it as a virtual cable—shows that the MASTER mix (MASTL/R) is routed to the currently active digital output (D.OUT).

4. Turn the Time/Value dial clockwise so that "cable" connects MONL/R to the D.OUT connector—"MONL/R" stands for "MONITOR Left/Right."


OUTPUT ASSIGN
OUTPUT
MST
AUX
MON
R-BUS
A
B
12
34
56
78
D.OUT
BUS
MSTL/R
MONL/R
RECL/R
AUX1/2

If you prefer, you can drag the output's connection box down to MONL/R using your mouse.

Adjusting Your Listening Level



If you're listening to the VS-2400CD through monitor speakers, the MONITOR knob to the left of the display sets your listening level. You'll generally want to keep this at the 0dB position (3 o'clock). Of course, you can always turn the MONITOR knob to raise or lower the listening level as needed—the 0dB position serves as a good starting point. Adjust your DS-90A/DS-50A INPUT LEVEL or monitor-speaker amplifier level settings so that the VS-2400CD is producing sound at a desirable level.

If you're using headphones, the setting of the MONITOR knob establishes the basic monitoring level, so set it to its 0dB position. To adjust your headphones' volume, turn the PHONES knob. Start with the knob turned all the way counter-clockwise, and slowly turn it clockwise to reach the desired listening level.

If you've connected a speaker system directly to the VS-2400CD and would like separate control of your speakers and headphones, route the MASTER outputs to the PHONES jack on the EZ ROUTING OUTPUT ASSIGN screen (see Steps 1-3 in "If You're Using DS-Series Monitors" on Page 73). The MONITOR knob will control only the speakers, and the PHONES knob will control the headphone level.

In the factory demos, the MASTER bus is routed to the PHONES jack, so the PHONES knob independently controls the level produced by the headphone jack.

Playing the Factory Demos

As shipped from the factory, your VS-2400CD has a few demonstration songs—"demos"—stored as projects on its internal hard drive. When you power up the VS-2400CD, the "Promises" project is loaded into the VS-2400CD, all of its settings are restored, and its track channel faders move to their last-saved positions.

Use of the demonstration songs supplied with this product for any purpose other than private, personal enjoyment without the permission of the copyright holder is prohibited by law. Additionally, this data must not be copied, nor used in a secondary copyrighted work without the permission of the copyright holder.

To save changes you've made to a demo, make a copy of the demo (Page 97). The demos loaded at the factory are write-protected (Page 95) and therefore not editable.

"Chemistry"

This section assumes you've just powered up the VS-2400CD and the demo project "Chemistry" is loaded. If this isn't the case, load "Chemistry"—see "Loading a Project" on Page 91. (The track sheets included in the VS-2400CD box contain demo details.)

Bring Down the MASTER Fader

To make sure the demo isn't too loud, first bring the MASTER fader all the way down.

The MASTER fader controls the level of the MASTER mix bus that's routed to the MONITOR bus (see "What's a Bus?" on Page 57). Since the MONITOR bus is supplying audio to the MONITOR and PHONES jacks—and to the digital output connected to DS-90Aor DS-50A Digital Reference Monitors—moving the MASTER fader adjusts your listening level.

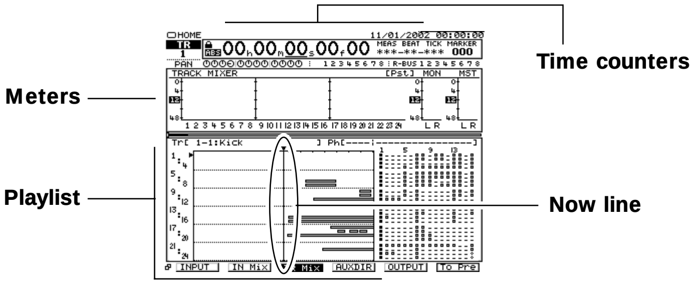
Starting Playback of the Demo

1. Press PLAY to begin playback.
2. Slowly bring up the MASTER fader to set the MASTER mix to a comfortable listening level.

If the demo finishes playing before you're done reading the following sections, press ZERO to restart it.

A Quick Look at What's on the Display

1. Press HOME•DISPLAY.
2. Press PAGE until "INPUT" appears on the display above F1.
   The display should look something like this:



3. If it doesn't, hold down SHIFT and press HOME•DISPLAY repeatedly until it does. You can also change the magnification of the playlist by holding down SHIFT and pressing ◀, ▶, ▲ and/or ▼.

You're now looking at the Home screen. This screen is so important that an entire chapter—Chapter 8, starting on Page 115—is devoted to it. For now, we'll just point out a few items of interest. They're labeled in the illustration above.

- *Time counters*—The time counters show your current location in the project. You can move to a new location by dialing in a new time in the counters, as described on Page 123.
- *Meters*—The meters show you important level information during recording and playback. If TR Mix above F3 isn't highlighted, press F3 (TR Mix). The meters are now showing you the level of each of the project's tracks.
- Playlist—The playlist shows the data on all of the project's tracks. Each chunk of data you see is called a "phrase," and is shown as a rectangle. As the project plays, the data moves from right to left. (We'll explain tracks, phrases and more on Page 84.)
- Now line—The now line is a visual representation of the time location shown in the counters. It shows you where in the project you are right now. When data in the playlist crosses the now line, you hear it.

Stopping and Starting Playback

- To stop listening to the demo before it ends, press STOP.
- To resume playback from the spot at which you stopped, press PLAY.
- To play the demo again from the top, press ZERO, and then PLAY.
- If you wish to, you can also use the REW (Rewind) and FF (Fast Forward) buttons to move to other locations in the project.

Navigating the Demo Using Locators

You can store up to 100 specific time locations in each project as "locators." By recalling a locator, you can instantly jump to its location in the project.

"Chemistry" contains 10 locators, all stored in Locator Bank 0—there are ten locator banks, numbered 0-9.

Here's where the locators in Bank 0 take you:

Locator Number:	*Takes you to:*	*At hour:minute:second:frame:subframe:*
00	*Downbeat*	*00:00:01:27:00*
01	*Guitar Intro*	*00:00:10:01:21*
02	*Verse 1*	*00:00:18:03:13*
03	*Chorus 1*	*00:00:50:11:41*
04	*Guitar Lick*	*00:01:06:15:55*
05	*Verse 2*	*00:01:14:17:79*
06	*Chorus 2*	*00:01:46:25:75*
07	*Bridge*	*00:02:03:00:32*
08	*Solo*	*00:02:23:04:93*
09	*Verse/Chorus Out*	*00:02:38:22:75*

You can recall locators when the project is playing or stopped—we'll recall them when the project isn't playing so you can see how they help you move through a project:

1. Press STOP to stop playback.
2. Press ZERO to return to the beginning—Time Zero—of the project.
3. If LOCATOR•BANK isn't lit, press it so that it lights. Since Locator Bank 0 is already selected, we only need to press the desired locator's second digit.
4. Press 0—the VS-2400CD takes you to Locator 00, the first downbeat of the song.
5. Press 5—you're now at the start of Verse 2.

Locators are discussed in detail in "Locators" on Page 179.

Adjusting Track Levels

The VS-2400CD's 12 physical channel strips (Page 35) can control any of the VS-2400CD's input, track, Aux master or FX return channels. See Chapter 10.

1. If Tr 1-12 isn't already lit, press it. Once it's lit, the channel strips control the sound of Tracks 1-12.
2. Press ZERO to return to the beginning, and then press PLAY to begin playback.
3. Slide the channel strip faders up and down to hear how they change the levels of the first 12 tracks in "Chemistry."
4. Press Tr 13-24 to assign the channel strips to the control of Tracks 13-24.
5. Explore the level changes you can make to Tracks 13-24.

Watching Automix in Action

Automix allows the VS-2400CD to memorize and play back mix-related settings, including any changes you make to those settings as the project plays.

“Chemistry” contains Automix data that adjusts various track channel levels throughout the course of the song. Since the VS-2400CD has motorized faders, you can literally watch some of these changes taking place.

1. Press AUTOMIX so that it lights—Automix is now turned on.
2. Press Tr 1-12 so the 12 channel strips are controlling Tracks 1-12.
3. Press 0 on the numeric keypad to jump to Locator 01 at the start of the song.
4. Press PLAY to begin playback and watch Automix at work.
5. Watch how Fader 10—the lead vocal track—leaps into position just before the lead singer begins singing.
6. As “Chemistry” continues to play, press Tr 1-12 and Tr 13-24 to watch what Automix does throughout the song on Tracks 1-12 and Tracks 13-24, respectively.
7. When you’re done, press ZERO and then AUTOMIX to turn it off.

See Chapter 25 to learn about Automix.

Recalling Scenes

The VS-2400CD can memorize up to 100 mix setups as “scenes.” Scenes allow you to:

- store and recall multiple versions of a mix.
- store and recall different versions of a project with different V-Tracks (Page 87).

“Chemistry” contains some scenes that show off the way scenes work.

1. Press SCENE•BANK so it lights.
   Scenes—like locators—are stored in banks of ten scenes each, numbered from 0-9. Since Scene Bank 0 is already selected, we only need to enter each desired scene’s second digit for the scenes in “Chemistry.”
2. Press 1 on the keypad. Scene 01—”Drums/Bass”—loads the settings it contains.

The name of the current scene appears in the top right area of a connected VGA monitor.

3. Play “Chemistry” to hear how it sounds in Scene 01.
4. Press STOP when you’re done and keep your eyes on the display.

You can recall scenes only while a project isn’t playing, so press STOP before attempting to recall a scene.

5. Press SCENE again, and then 2 on the keypad to recall Scene 02—”4FX Mix”. The display changes to show that this scene uses different V-Tracks than Scene 01.
6. Press ZERO and then PLAY to listen to the way the song’s changed.
7. Try out the other scenes in “Chemistry.”

To learn about storing scenes, recalling them and more, see “Scenes” on Page 139.

Other Demo

Your hard drive also contains other VS-2400CD demo. To learn how to load it, see “Loading a Project” on Page 91.

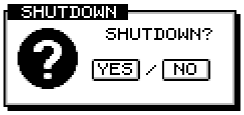
Turning Off the VS-2400CD

It's important the you don't simply flip the VS-2400CD's POWER switch to turn it off—always use the procedure below to prevent damage to your data.

If you'd like to restart the VS-2400CD—perhaps while troubleshooting a problem—use the procedure below as well.

Turning Off the VS-2400CD

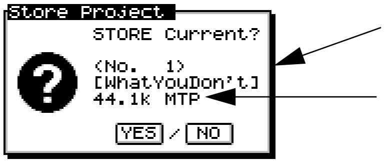
1. Hold down SHIFT, and press STOP•SHUTDOWN. The following dialog appears:



SHUTDOWN

SHUTDOWN?

2. If you wish to turn off or restart the VS-2400CD, press ENTER/YES. If not, press EXIT/NO to cancel the operation. If you press ENTER/YES, a dialog like this one appears:



Store Project

STORE Current?

<No. 1>
[WhatYouDon't]
44.1k MTP

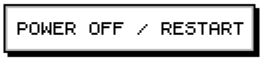
The name of the currently loaded project.

The project's sample rate and recording mode (Page 93).

3. If you've made changes to the currently loaded project you'd like to preserve, press ENTER/YES. If you haven't, press EXIT/NO.

If you're shutting down the VS-2400CD when a factory demo song—or any other protected project—is loaded, you won't be prompted to store the current song.

In either case, the VS-2400CD takes a few moments to prepare to shut down—and to save your project if you pressed ENTER/YES in Step 3. When the VS-2400CD is ready to be powered off, the following message appears:



POWER OFF / RESTART

4. If you'd like to restart the VS-2400CD, hold down SHIFT and press PLAY•RESTART—the VS-2400CD begins its power-up sequence. If you'd like to shut down the VS-2400CD, flip its rear-panel POWER switch to its Off position.

If you need to move the VS-2400CD after shutting it down, wait 30 seconds or so to give its hard drive a chance to stop spinning in order to avoid damaging it.

5—Understanding Effects

Harnessing the VS-2400CD's Effects

The VS-2400CD provides a range of creative possibilities when it comes to effects. How and where you apply them will have a big impact on the sound you achieve.

This chapter discusses important effect-related ideas, including:

- *effect routings*—How you get your signals in and out of an effect has a lot to do with the way they'll sound.
- *master effects*—You can add effects to your entire mix. This ability is especially important when you're creating a final master.
- *when and where to apply effects*—You can add effects as you record, during mixdown, or add them to your entire mix at once. We'll offer some tips that'll help you decide when and where to apply your effects.
- *external effects*—You can send signals out of the VS-2400CD, into external effects-processing devices, and back, if you wish to.

Dry and Wet

"Dry" and "wet" are two terms that are frequently used in any discussion of effects, providing a shorthand way to say whether or not a signal has had effects applied to it:

- *dry*—A dry signal is a signal to which you haven't applied an effect.
- *wet*—A wet signal is a signal to which you have applied an effect.

You can bring a signal into the VS-2400CD that already uses an effect—from the effect processor built into a synthesizer, for example—but for our purposes, until you add a VS-2400CD effect to the signal, we'll consider it dry.

Effect Routings

There are two basic methods you can use to apply an effect to a signal.

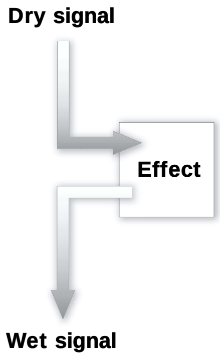
You can:	*Term for an effect applied this way:*
replace the dry signal with a wet version of the signal so that only the wet version is heard.	insert effect
add a wet version of the signal to the dry version so that both are heard.	loop effect

Loop effects are sometimes called "send-and-return effects."

The method you'll choose depends on the type of effect you're applying to your signal—the patch list in the *VS-2400CD Appendices* shows the suggested use for each effect patch. We'll describe how to set up insert and loop effects in Chapter 16 starting on Page 207. The following sections explain how the two methods work.

Insert Effects

An insert effect detours a signal as it makes its way through the VS-2400CD. The signal is diverted into the effect, processed, and the effect's output—the wet version of the signal—takes the original signal's place and resumes its journey. The name "insert effect" refers to the idea that you've inserted the effect in the signal's path.



When To Use Insert Effects

You'll typically want to insert the following types of effects:

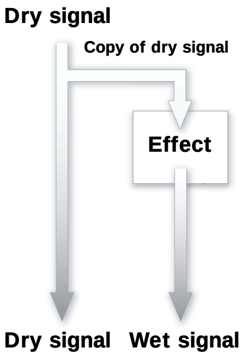
- dynamics-based effects like compressors, limiters, gates and expanders
- distortion effects
- chorus, flanger and phaser effects
- guitar and vocal multi-effects
- Microphone, Amp and Speaker Modeling
- rotary speaker effects
- filter effects such as EQs and vocoders

Insert effects act a lot like the small effects boxes and pedals through which guitarists, bassists and keyboardists run their instruments on their way to their amps. Any type of effect you might apply in this way is a good insert-effect candidate.

Loop Effects

With a loop effect, you combine two different versions of the signal: the original dry signal and an effected, wet version. This is accomplished in two stages.

- You *send* a copy of the signal into the effect.
- You *return* the output of the effect—the wet version of the signal—to a mixer channel, and combine this channel's signal with the original signal.



About the Terms "Send" and "Return"

"Send" and "return" are used in mixing as both verbs and nouns. This can be confusing to beginners, so let's be clear about what we mean.

When we use:	*As a verb, it describes the act of:*	*As a noun, it refers to:*
Send	directing a signal into an effect, as in "Send Track Channel 1 into Effect 1."	the device we use to carry the copy into the effect, as in "Adjust the send." Also, the copy itself, as in "The send is too loud."
Return	routing the effect's output into a channel, as in, "Return Effect 1 to FX Return Channel 1."	the channel into which the effect's output is routed, as in "Adjust the return."

Aux Sends

In the VS-2400CD, the first four of the eight Aux send busses provides a pathway into one of the four internal effects. By default, Aux 1 carries signals into Effect 1, Aux 2 to Effect 2, and so on. When you want to send an input, track or even an FX return channel's signal to an internal effect, you send it to the corresponding Aux bus—you can set how much of the signal you want to send to the effect by setting the AUX send level on its CH EDIT screen or by using the channel strip faders (Page 136).

Pre-Fader and Post-Fader Sends

The VS-2400CD allows you to send a signal to an Aux bus from either of two places as the signal makes its way through a channel. You can send it:

- *pre-fader*—to send the signal to the Aux bus before the signal reaches its channel fader. The Aux send level isn't affected by changes you make to the fader's position—it stays the same even if the level of the signal itself changes. This can be handy, for example, if you're using an Aux bus to create a headphone mix for performers, and don't want them to be bothered by changes you make to the channel's output level. It can also be useful if you're sending a signal to an effect and want its effect level to remain constant as the level of the signal itself changes.
- *post-fader*—to send the signal to the Aux bus after its fader. Changes you make to the signal's level using its fader affect the amount of the signal sent to the Aux bus. As the fader goes up, the Aux send level goes up, and vice versa. This can be especially useful when you're using the Aux bus to add an effect to the signal—the relationship between the signal level and effect level stays the same as you change the signal's level. You'll usually want to use a post-fader send for effects.

Each Aux bus can be configured to accept either pre-fader or post-fader signals from the input, track and FX return channels, as described on Page 201.

When To Use Loop Effects

You'll use loop effects any time you want to add an effect to a signal so that both the signal and the effect are heard. The most frequent use of loop effects is with reverbs and delays, the two most frequently used effects there are.

Master Effects

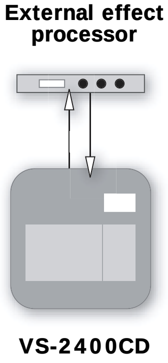
The VS-2400CD allows you to apply an effect to your entire mix at once. You can do this by inserting the effect into the main MASTER mix's signal path. While you can do this at any time, this capability is particularly important when creating final stereo mastering tracks in preparation for burning an audio CD. The VS-2400CD's Mastering Tool Kit (MTK) effects are specially designed for this purpose and provide everything you need to add the final touches to your recordings.

? *Mastering tracks*

External Effects

While the VS-2400CD provides a wide range of effects, you may wish to send a signal out of the VS-2400CD and into an external effect processor. You'll use the processor's effect as a loop effect, by:

- sending the signal to an Aux bus
- routing the Aux bus to one of the VS-2400CD's outputs
- connecting the output to the input of the external device
- processing the signal inside the external device
- connecting the device's output to one of the VS-2400CD's inputs to return the wet signal to the VS-2400CD.



We'll describe this procedure in more detail on Page 209.

Even though an external effect is always a loop effect, you can simulate an insert effect by using only the external processor's return, and none of the original dry signal.

Getting the Most From Your Effect Processors

It's important to be strategic about how you employ your effects so that you'll have the effects you need at each step along the way as you record and mix your project. Even engineers in the best-equipped studios in the world may find that they wish they had one more effect processor available from time to time. The simple truth is that while an effect processor's creating a particular effect, it's not available for any other use.

Here's an example. If you've got only the factory-installed effect processing in your VS-2400CD and are already using Effect 1 and 2, you don't have any other internal effect processors available for a third effect. (This is why we recommend installing an additional VS8F-2 Effect Expansion Board in your VS-2400CD.)

Consider Recording Your Effects As You Go

The solution is planning. Try to work out in advance the effects you'll need for all of the elements in your project. This will allow you to budget your effect-processing power.

One of the main tricks you can use to be sure you've got all the effects you need is to apply a signal's effect as you record the signal—the resulting track contains both the signal *and* its effect. This is called "printing" the effect. The benefit of recording your effects as you go is that it frees up the effect processor for later use.

This method isn't without risk, however: Once you've recorded an effect onto a track along with a signal, the effect can't be altered or removed. It can also be difficult to anticipate how a signal and its effect will sound when all other project elements have been recorded and are in place.

If you've got spare tracks, you can hedge your bets by recording the signal on one track, its effect on another, and then combining them later into a single track—or pair of tracks if you're using a stereo effect—once you're sure you like what you've got.

Even so, printing effects with your tracks can be a real lifesaver in a project that needs lots of effects.

Printing effects can also make a mix easier, since the printed effects will have already been dealt with, freeing you up to concentrate on other details during the often-complex mixing process.

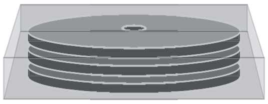
6—Understanding the Hard Disk Recorder

This describes the fundamentals of hard disk recording in the VS-2400CD. If you're new to hard disk recording, you'll find all the basics here. We'll explain:

- what a hard disk drive is.
- how a VS-2400CD hard drive organizes data.
- how a hard drive must be prepared for use by the VS-2400CD.
- how the VS-2400CD records audio on a hard drive.
- how the VS-2400CD plays back audio recorded on a hard drive.
- non-destructive, pointer-based editing.
- what a VS-2400CD phrase is.
- what a VS-2400CD V-Track is.
- what a VS-2400CD track is.
- what a VS-2400CD region is.

Even experienced users should read about VS-2400CD tracks and their contents: takes, V-Tracks, phrases and regions. You'll need to understand what each of these is to fully master the VS-2400CD editing capabilities. See Page 87.

VS-2400CD Hard Disk Drives



What's a Hard Drive?

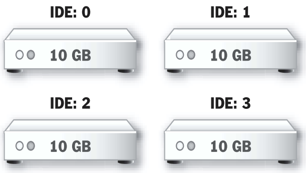
A hard drive is a hardware mechanism that contains one or more rigid platters—that's why it's called a "hard" drive—on which data is stored. A hard drive may also be referred to as a "disk drive." In the VS-2400CD, your hard drive stores all of your recordings and project settings. A hard drive is a great way to store and quickly retrieve data, and provides for some amazing features, as we'll see.

Your VS-2400CD shipped from the Roland factory with a 40 GB (gigabyte) IDE hard drive installed. This provides lots of space for your projects.

How a VS-2400CD Hard Drive Organizes Data

A VS-2400CD hard drive divides up its total disk space into sections called "partitions." Partitions help keep project data together on the hard drive. Each partition acts like a separate virtual drive—it even looks that way on the VS-2400CD's screens.

Your 40 GB VS-2400CD internal hard drive was divided into four approximately 10 GB partitions at the factory. These partitions are labeled IDE:0, IDE:1, IDE:2 and IDE:3.



Internal hard drive

When we refer to a "drive" in the rest of the *VS-2400CD Owner's Manual*, we'll be referring to a partition. This reflects that way the VS-2400CD's software views partitions, and will make disk- and drive-related operations easier to explain and understand. When we need to refer to an entire hard disk mechanism, we'll call the mechanism a "hard drive."

Preparing a Hard Drive for Use

Before you can use a new internal hard drive with the VS-2400CD, it must be prepared for use. The hard drive must be erased, formatted and divided into partitions using the FmtDrv (for "Format Drive") command described on Page 108.

The internal hard drive that came with your VS-2400CD was formatted and partitioned before the demo songs were installed at the factory. It's ready to be used as is.

How Audio Is Recorded on a VS-2400CD Hard Drive

Each time you record audio in the VS-2400CD, the audio is stored as a disk file comprised of digital data. This file is called a "take." It includes your audio and a time-stamp of the date and time at which the recording took place. Until you perform a project optimization (Page 96), the VS-2400CD holds on to all of the takes you've recorded in a project.

Even when you re-record a performance—"recording over" your first attempt—the original take remains on your hard drive and is still available to you should you want it. And when you edit a recording on the VS-2400CD, you don't actually edit the take itself, thanks to non-destructive, pointer-based editing, which we'll discuss shortly.

How Recordings Are Played Back

Random Access

When your VS-2400CD plays back your music from a hard drive, it uses something called "random access" playback. The phrase "random access" has its roots in computer programming, but what it means to you is this: The VS-2400CD recorder can instantly play any audio in a project located anywhere on its hard drive.

Random access playback produces a couple of very important benefits:

- You never have to wait for the recorder to rewind or fast-forward to a location in a project. The VS-2400CD gets where it needs to go in a heartbeat.
- The VS-2400CD can employ pointer-based playback and editing.

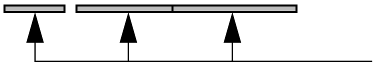
What's Pointer-Based Playback?

When you play a recording, the VS-2400CD uses a set of "pointers" to identify the audio you want to play. Each pointer contains a piece of information about the audio. Among other things, pointers allow the VS-2400CD to play parts of a take, rather than having to play the entire disk file from beginning to end. A simple set of pointers might include:

- the identity of the take that contains the desired audio.
- the time location within the take at which playback is to begin.
- the time location within the take at which playback is to end.

Phrases

A set of pointers is called a "phrase." Every time you make a new recording, the VS-2400CD automatically creates a new phrase to play the new audio. Each phrase appears in the Home screen's playlist (Page 118) as rectangle.



Each phrase is a rectangular box. This illustration shows a string of three phrases.

Phrases are also created in other ways:

- Any time you re-record a portion of a track—typically by punching (Page 185)—the new recording appears on the track as a phrase.
- You can create a new phrase that plays a currently unused take.

You can perform various editing operations on phrases, and edit regions of audio within phrases, as we'll discuss later in this chapter, on Page 88.

Virtual Tracks, or "V-Tracks"

As you record audio, punch in and out and edit it, you create a string of phrases positioned one after the other in the order in which they'll play back. This string of phrases is called a "Virtual Track," or "V-Track" for short.

From here on in the *VS-2400CD Owner's Manual*, we'll refer to a string of phrases by its short name: "V-Track."

Of course, if you've made a recording but haven't done any punching or editing, the V-Track that plays it will consist of just the one phrase that plays the entire take.

Non-Destructive, Pointer-Based Editing

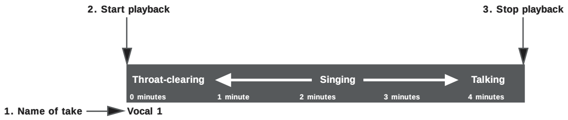
Pointer-Based Editing

When you edit audio on the VS-2400CD, what you're actually doing is editing a phrase, the set of pointers that instruct the VS-2400CD how to play the audio. You're not actually changing the take stored on your hard disk at all—you're only editing its pointers. This type of editing is called "non-destructive editing" because it does no harm to the take itself. It doesn't alter the take at all.

A few editing operations change audio by copying it and altering the copy—even so, the original take remains unaffected, and the pointers simply point to the copied audio.

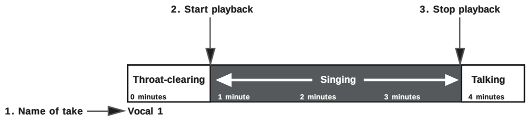
This illustration shows how erasing unwanted audio from a recording affects its pointers. The dark portion of the take is the part that you hear during playback.

Before editing:



2. Start playback
3. Stop playback
Throat-clearing
Singing
Talking
0 minutes
1 minute
2 minutes
3 minutes
4 minutes
1. Name of take
Vocal 1

After editing:



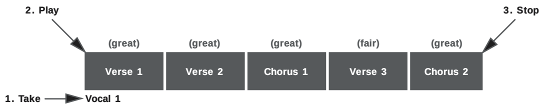
2. Start playback
3. Stop playback
Throat-clearing
Singing
Talking
0 minutes
1 minute
2 minutes
3 minutes
4 minutes
1. Name of take
Vocal 1

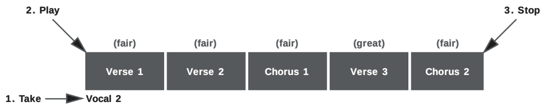
All you've really done is changed the positions of Pointers 1 and 2.

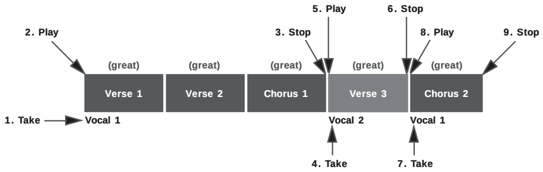
Though we're creating pointers and pointer names here for demonstration purposes, the VS-2400CD takes care of all this in its internal programming language.

Because random access playback is so fast, the VS-2400CD jumps from one location within the take to another so quickly it sounds as if it's playing one continuous recording.

The VS-2400CD can also jump from one take to another during playback. In the illustration below, a phrase on one V-Track contains a great vocal performance except for the third verse. A phrase on a second V-Track has a great Verse 3. Here's what happens if you copy Verse 3 from the second V-Track to the first:


First V-Track's phrase
2. Play
3. Stop
(great)
(great)
(great)
(fair)
(great)
Verse 1
Verse 2
Chorus 1
Verse 3
Chorus 2
1. Take
Vocal 1


Second V-Track's phrase
2. Play
3. Stop
(fair)
(fair)
(fair)
(great)
(fair)
Verse 1
Verse 2
Chorus 1
Verse 3
Chorus 2
1. Take
Vocal 2


Best parts of both, now in the first V-Track's phrase
5. Play
6. Stop
2. Play
3. Stop
8. Play
9. Stop
(great)
(great)
(great)
(great)
(great)
Verse 1
Verse 2
Chorus 1
Verse 3
Chorus 2
1. Take
Vocal 1
Vocal 2
Vocal 1
4. Take
7. Take

The VS-2400CD creates and places all of its pointers behind the scenes—all you experience is that the first phrase now contains a completely great vocal performance.

You can also move or copy entire phrases to new locations on the same V-Track or from one V-Track to another—and much more—as described in Chapter 19.

The Advantage of Non-Destructive Editing

Non-destructive editing allows you to undo any edits you perform because all of your original hard disk recordings—your takes—remain safe and sound on your hard disk no matter how many edits you perform on the phrases that play them. It's only their pointers that have been edited.

This provides a tremendous amount of creative freedom. You can feel free to explore any creative editing possibility without worrying that you won't be able to get back to where you started.

If you're sure you no longer need your discarded data, you can clear it from your hard drive to gain disk space by performing a project optimization, described on Page 96.

What Is a VS-2400CD Track?

The VS-2400CD's 24 tracks resemble the tracks of a traditional multitrack recorder, so its basic operation feels familiar and comfortable to anyone who's used a multitrack recorder. In fact, VS-2400CD tracks are something a bit different, something that provides an incredible amount of recording power.

If...

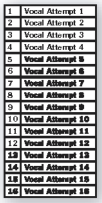
- a recording is stored on your hard drive as a disk file called a "take," and
- the sets of pointers that tell the VS-2400CD how to play a take are called "phrases," and
- a group of phrases strung together for playback is called a "V-Track"

...then what's a track?

In the VS-2400CD, a track is a collection of 16 V-Tracks, any *one* of which can be selected at any given time. When a V-Track is selected, you can record on it or play it back.

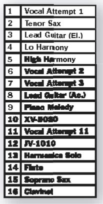
Each track's 16 V-Tracks can contain anything you want. They can play the same take (or takes) in different ways or they can each contain completely different things altogether.

Related recordings on all of the track's V-Tracks



1	Vocal Attempt 1
2	Vocal Attempt 2
3	Vocal Attempt 3
4	Vocal Attempt 4
5	Vocal Attempt 5
6	Vocal Attempt 6
7	Vocal Attempt 7
8	Vocal Attempt 8
9	Vocal Attempt 9
10	Vocal Attempt 10
11	Vocal Attempt 11
12	Vocal Attempt 12
13	Vocal Attempt 13
14	Vocal Attempt 14
15	Vocal Attempt 15
16	Vocal Attempt 16

Assorted recordings on the track's V-Tracks



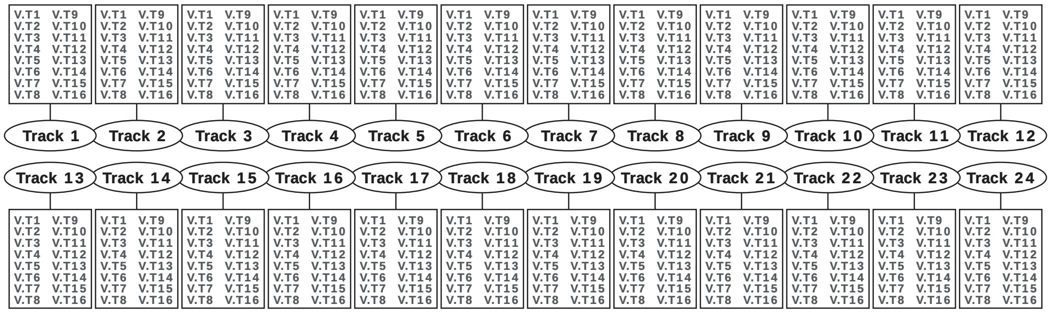
1	Vocal Attempt 1
2	Tenor Sax
3	Lead Guitar (El.)
4	Lo Harmony
5	High Harmony
6	Vocal Attempt 2
7	Vocal Attempt 3
8	Lead Guitar (Ac.)
9	Piano Melody
10	XV-5080
11	Vocal Attempt 11
12	JV-1010
13	Harmonica Solo
14	Flute
15	Soprano Sax
16	Clavinet

You can select which of its 16 V-Tracks each track will play at any given time. We'll describe how to do this on Page 147.

When you record or play a V-Track, the settings of the corresponding track channel determine what it sounds like. Track 1's currently selected V-Track is heard through Track Channel 1, Track 2's V-Track through Track Channel 2, and so on. Track channels are discussed in Chapters 10, 11 and 14.

The Power of V-Tracks

Although the VS-2400CD is a 24-track studio, in a very real sense it's way more than that. Since each of its 24 tracks can play any of 16 V-Tracks, a project can actually hold as many as *384* recordings from which you can choose 24 for playback at any given time.


V.T1
V.T2
V.T3
V.T4
V.T5
V.T6
V.T7
V.T8
V.T9
V.T10
V.T11
V.T12
V.T13
V.T14
V.T15
V.T16
Track 1
Track 2
Track 3
Track 4
Track 5
Track 6
Track 7
Track 8
Track 9
Track 10
Track 11
Track 12
Track 13
Track 14
Track 15
Track 16
Track 17
Track 18
Track 19
Track 20
Track 21
Track 22
Track 23
Track 24

As you can see, this gives you with a *huge* sonic palette to work with. You can even construct totally different versions of a project from its massive collection of V-Tracks.

Track Editing Basics

During editing operations, the word "track" serves as a shorthand for the currently selected V-Track. When we say we're editing a track, what we literally mean is that we're editing the audio on the track's currently selected V-Track.

The following sections provide just a brief introduction to the editing of tracks in the VS-2400CD. We'll discuss it in detail beginning in Chapter 18, which starts on Page 231.

There are two basic ways you can edit the contents of a track:

- You can work with phrases (Page 85).
- You can work on a specific time "region" within a track.

About Editing Phrases

Phrase editing is the quickest way to work with a track's audio, since it works with pre-defined chunks of the track. You can perform a range of operations on a phrase—these are detailed in Chapter 19.

You may also find it handy to manually divide the phrases on a V-Track into new convenient, easy-to-work-with chunks. Though this can take a little time, it can save you a *lot* of time later on in the editing process:

- If you're working on a song, and think you'll be moving a track's sections around, you can turn each section into a phrase. This'll let you simply grab the desired phrase when it's time to assemble the track.
- If you're working with sound effects, you can turn each one into a separate phrase, making the positioning of your elements quick and easy.

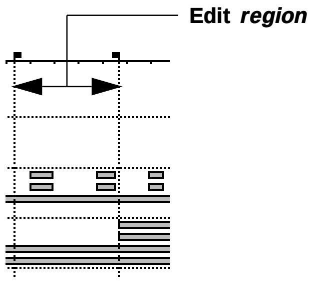
The phrase DIVIDE operation can automatically separate your audio into separate phrases, as described on Page 256.

About Editing Regions

A region is a selected time range within a track. You define the region you want to edit by placing two "edit points":

- IN—The position of the IN marker determines the beginning of the section you want to edit. This location is called the "IN point."
- OUT—The position of the OUT marker determines the end of the section you want to edit. This location is called the "OUT point."

The region is the portion of the track that occurs after the IN point and before the OUT point. It can contain data from one or more phrases, and can also contain silence.



Chapter 18 describes how to set IN and OUT points for track editing, as well as two other very important editing points, FROM and TO. See Page 232.

Chapter 20, beginning on Page 261, describes region editing operations.

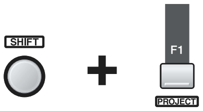
7—Project and Drive Operations

This chapter describes the various project- and hard drive-related activities you can perform from the VS-2400CD's PROJECT menu screens. Most everything that has to do with an entire project can be found on this menu.

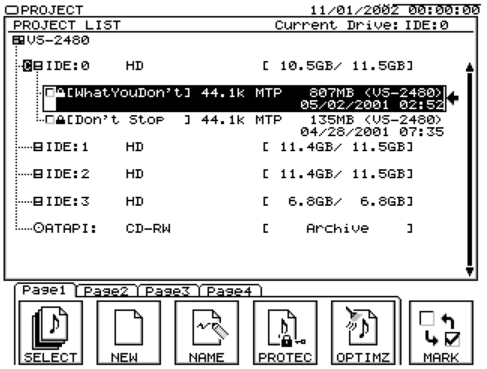
You can quickly save the latest changes you've made to the currently loaded project by holding down SHIFT and pressing ZERO•STORE. We recommend you do this often.

Navigating the PROJECT Menu Screens

1. Hold down SHIFT and press F1 (PROJECT).


SHIFT
+
F1
PROJECT

2. The VS-2400CD scans your hard drive and CD-RW drive. When it's done, the first PROJECT menu screen appears.



```
PROJECT                                   11/01/2002 00:00:00
PROJECT LIST                        Current Drive: IDE:0
VS-2480
  IDE:0      HD                    [ 10.5GB/ 11.5GB]
    [WhatYouDon't] 44.1k MTP    807MB (VS-2480)
                               05/02/2001 02:52
    [Don't Stop  ] 44.1k MTP    135MB (VS-2480)
                               04/28/2001 07:35
  IDE:1      HD                    [ 11.4GB/ 11.5GB]
  IDE:2      HD                    [ 11.4GB/ 11.5GB]
  IDE:3      HD                    [  6.8GB/  6.8GB]
  ATAPI:     CD-RW                 [    Archive    ]
```

Page1
Page2
Page3
Page4
SELECT
NEW
NAME
PROTEC
OPTIMZ
MARK

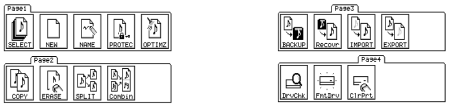
Currently selected drive

The project that's currently loaded in the VS-2400CD's memory is shown in white type on a black background in the project list.

The project list occupies the top of every PROJECT menu screen.

Tabbed layers of F Buttons

To perform a project- or hard drive-related operation, press the operation's F button, shown on a tabbed layer at the bottom of the screen.


Page1
SELECT
NEW
NAME
PROTEC
OPTIMZ
Page2
COPY
ERASE
SPLIT
Combin
Page3
BACKUP
Recovr
IMPORT
EXPORT
Page4
DrvChk
FmtDrv
ClrPrt

If you're looking for an operation whose F button is currently hidden, press PAGE repeatedly until its F button appears.

Working with the PROJECT LIST

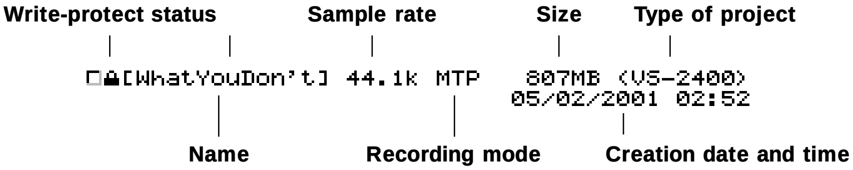
You can scroll through the items in the project list by pressing ▼ or ▲.

As noted in "How a VS-2400CD Hard Drive Organizes Data" on Page 83, each hard drive partition is called a "drive."

The project list shows all your available drives. Your internal drives are labeled as "IDE:(partition number)." As shipped from the factory, these partitions are IDE:0, IDE:1, IDE:2 and IDE:3. Your CD-R/RW drive is shown as "ATAPI."

If you encounter error messages when working with your CD-R/RW drive, check Page 343 or the *VS-2400CD Appendices* to learn what the messages mean.

In the project list, you can also see all of the projects on the currently selected drive. The VS-2400CD provides information about each project.



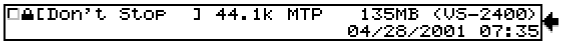
```
□🔒[WhatYouDon't] 44.1k MTP   807MB (VS-2400)
                            05/02/2001 02:52
```

We'll discuss write-protection, project sample rates and recording modes later on in this chapter.

Selecting an Item in the Project List

To select a project or drive shown in the project list:

1. Press ▼ or ▲ or turn the Time/Value dial until the desired item is outlined.

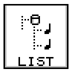


```
□🔒[Don't Stop  ] 44.1k MTP   135MB (VS-2400)
                            04/28/2001 07:35
```

When an item is outlined and has an arrow pointing to it from the right, it's selected.

To Display the Projects on a Drive

1. Select the drive. When a drive is selected, the LIST button appears in the screen's lower-right-hand corner.
2. Press LIST—the VS-2400CD displays a list of the projects on the drive.

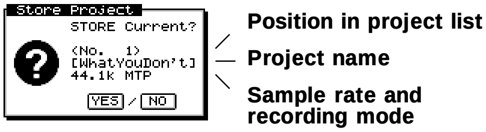


PROJECT menu
F6 (LIST)

To view the contents of an audio CD, see "The CD Player Feature" on Page 343.

About "Store Current?" Messages

During the course of most PROJECT menu operations, the VS-2400CD asks you:



```
STORE Current?
(No.   1)
[WhatYouDon't]
44.1k MTP
```

The VS-2400CD displays this message when an operation needs to temporarily borrow the part of the VS-2400CD's memory that holds the currently loaded project—after the operation is complete, the VS-2400CD re-loads the project from your hard drive. If you've made any changes to the project since you last stored it, press ENTER/YES in response to this message to ensure that those changes aren't lost.

If a project is write-protected (Page 95), this message doesn't appear, since the project is locked to prevent the making of any changes to it.

Project Operations

About F6 (MARK)

PROJECT menu
F6 (MARK)

Before you can perform some of the project operations, you have to target the project on which you want to perform the operation. You do this by marking the project.

Marking a Project

1. Press ▼ or ▲ or turn the Time/Value dial to select the project.
2. Press F6 (MARK) to place a checkmark to the left of the project's name, thus targeting it.

F6 (MARK) is available only when a project, not a drive, is selected.

SELECT

PROJECT menu
F1 (SELECT)

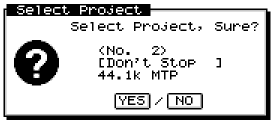
Press SELECT to load the project that's currently highlighted in the project list. When it's loaded, it replaces the project that's currently stored in the VS-2400CD's onboard memory. You can play, record, edit and mix a project only while it's loaded into the VS-2400CD.

The SELECT button doesn't look quite like any other VS-2400CD menu button, and it acts differently, too. It's the only button that performs its action as soon as you press it. All of the other buttons merely display the corresponding operation's screens.

To load a project from another drive, select the drive and press F6 (LIST), as described in "To Display the Projects on a Drive" on Page 90.

Loading a Project

1. Hold down SHIFT and press F1 (PROJECT).
2. If "SELECT" isn't visible above F1, press PAGE until it is.
3. In the project list, select the project you want to load.
4. Press F1 (SELECT). The VS-2400CD displays:

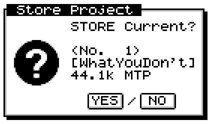


Select Project

Select Project, Sure?

<No. 2>
[Don't Stop]
44.1k MTP

5. Press ENTER/YES to load the selected project, or EXIT/NO to cancel the operation. If you pressed ENTER/YES, the VS-2400CD asks:



Store Project

STORE Current?

<No. 1>
[WhatYouDon't]
44.1k MTP

If the currently loaded project is write-protected (Page 95), the VS-2400CD loads the new project without displaying this question.

6. Press ENTER/YES to store your latest changes to the currently loaded project before loading the new one, or EXIT/NO to skip re-saving it.
   The VS-2400CD loads the selected project into its memory.

NEW

When you create a new project, you make two important choices that determine both the nature of the project and what you can do with its audio. While these choices are a product of the VS-2400CD's great flexibility, they can't be changed once the project's been created, and so they must be made carefully. Before we go through the steps involved in creating a new project, let's discuss these decisions so you'll know what to do when you encounter them during project creation.

Sample Rate

All digital recorders record audio by creating a numerical representation of the audio at a particular moment in time—this numerical representation is called a "sample." By creating samples many thousands of times per second—and playing them back just as quickly—the illusion is created of a single stream of continuous audio. In fact, what you're hearing is really a series of separate samples.

Since audio is constantly changing, the more samples a recording device makes per second, the greater its chances are of faithfully capturing and reproducing its sound.

The number of times per second that a digital recorder samples audio is called its "sample rate." The VS-2400CD can record audio at a variety of sample rates.

This sample rate:	*Creates this many samples per second:*
32k (kiloHertz)	32,000
44.1kHz	44,100
48kHz	48,000
64kHz	64,000
88.2kHz	88,200
96kHz	96,000

Sample rates are displayed in kiloHertz, or thousands of cycles/samples. On the VS-2400CD's project NEW screen, "kHz" is abbreviated as "k."

You might think you'd always use the highest sample rate, but it's not that simple. Higher sample rates use up disk space faster, and there's an even more serious issue:

- *Audio CDs can only play audio recorded at 44.1k*. If you plan to write your project onto an audio CD, use the 44.1k sample rate. (Chapter 26 describes creating audio CDs.)

While you *can* export non-44.1k audio from the VS-2400CD via R-BUS or as .WAV files (Page 346) for processing and eventual return to the VS-2400CD for CD-burning, sample rate conversion generally reduces a sound's quality. It's smarter to record your audio at 44.1k in the first place if you plan to deliver it to listeners on an audio CD.

The other available sample rates are provided for special needs. Recording at 96k offers the highest recording quality but, so far, only DVDs can utilize 96k audio—if you're doing a project for DVD, 96k recording is therefore a consideration. The 48k sample rate can be helpful if you're digitally importing 48k-recorded tracks from an external digital device.

Some effect patches are not available in projects that use a 64k-or-higher sample rate.

Recording Mode

The VS-2400CD provides eight "recording modes" from which to choose. A project's recording mode configures the VS-2400CD's hard disk recorder at the desired balance between a project's audio quality, how many tracks the project contains, and the amount of disk space its audio consumes.

Unless you have a reason to do otherwise, use the 24-track, 24-bit MTP recording mode. The *VS-2400CD Owner's Manual* assumes that your projects use this mode, except as noted.

Description of Each Recording Mode

Recording mode:	*Description:*
M24 (Mastering 24-bit)	Audio is recorded as linear 24-bit data.
MTP (Multi Track Pro)	This is the VS-2400CD's default 24-bit recording mode.
CDR (CD-R Writing)	Audio is recorded as 16-bit linear data in a CD disk-image file format ready for burning to an audio CD (Page 330)—great for compiling mastering tracks for an album's worth of songs.
M16 (Mastering 16-bit)	Audio is recorded as 16-bit linear data similar to that produced by a CD player or DAT recorder.
MT1 (Multi Track 1)	This recording mode offers twice the recording time of M16 while preserving its sound quality.
MT2 (Multi Track 2)	This mode offers even more recording time than MT1.
LIV	Use the LIV mode when you're doing live recording and can't be sure how long you'll need to keep recording. It's also handy if you're running out of space on your hard drive.
LV2	Use LV2 for recording speech, for reference recordings, or if you're concerned about running out of disk space.

Number of Available Playback Tracks in Each Recording Mode

The number of playback tracks in each mode depends on the selected sample rate:

Recording mode:	*Tracks up to 48k:*	*Tracks at 64k and higher:*
M24	Tracks 1-16	Tracks 1-8
MTP	Tracks 1-24	Tracks 1-12
CDR	Tracks 1-16*	*
M16	Tracks 1-16	Tracks 1-8
MT1	Tracks 1-24	Tracks 1-12
MT2	Tracks 1-24	Tracks 1-12
LIV	Tracks 1-24	Tracks 1-12
LV2	Tracks 1-24	Tracks 1-12

* Use the 44.1k sample rate when creating a CDR mode project since only 44.1k audio can be burned onto a CD. Tracks in CDR mode are linked as odd/even pairs.

Number of Available Simultaneous Recording Tracks in Each Recording Mode

- All modes can record up to 16 tracks at once if the sampling rate is 48k or lower.
- All modes can record up to 8 tracks at once if the sampling rate is 64k or higher.

Amount of Recording Time with Each Recording Mode

This chart shows the number of minutes you'd get when recording a single track in a single 10G partition. The available time depends on the selected sample rate.

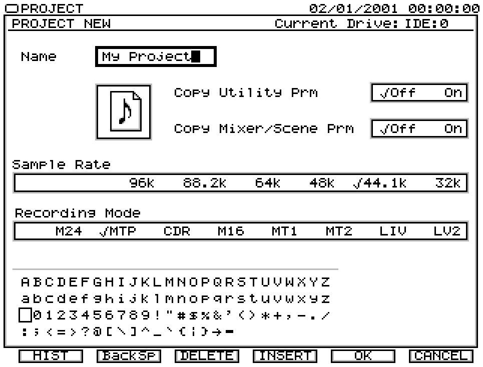
Mode:	*96k*	*88.2k*	*64k*	*48k*	*44.1k*	*32k*
M24	658	716	987	1,316	1,433	1,975
MTP	1,977	2,152	2,966	3,954	4,305	5,932
M16	988	1,076	1,483	1,977	2,152	2,966
CDR	988	1,076	1,483	1,977	2,152	2,966
MT1	1,977	2,152	2,966	3,954	4,305	5,932
MT2	2,635	2,866	3,953	5,271	5,732	7,907
LIV	3,163	3,442	4,744	6,326	6,885	9,489
LV2	3,954	4,304	5,932	7,909	8,609	11,864

Creating a New Project

1. Hold down SHIFT and press F1 (PROJECT).
2. If "NEW" isn't visible above F2, press PAGE until it is.
3. Press F2 (NEW)—the PROJECT NEW screen appears.

NEW

PROJECT menu
F2 (NEW)



PROJECT 02/01/2001 00:00:00
PROJECT NEW Current Drive: IDE:0
Name: My Project
Copy Utility Prm: √Off On
Copy Mixer/Scene Prm: √Off On
Sample Rate: 96k 88.2k 64k 48k √44.1k 32k
Recording Mode: M24 √MTP CDR M16 MT1 MT2 LIV LV2

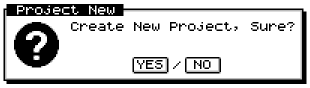
4. Set the Copy System Prm parameter to:
   - *Off*—to create a new project with default UTILITY menu parameter values (UTILITY menu parameters are described in Chapter 27).
   - *On*—to copy the current project-related UTILITY parameter values into the new project.
5. Set the Copy Mixer/Scene Prm parameter to:
   - *Off*—to create a new project with default mixer settings and no scenes.
   - *On*—to copy the mixer settings and scenes from the currently loaded project into the new project.

Since scenes remember effect patch edits, copying scenes lets you move effect settings from the current project into the new one you're creating.

6. Select the desired sample rate and recording mode (Page 92).
7. Name the new project.

You can re-name the project later on—and add a comment, if you like—using the project NAME operation (see Page 95).

8. Press F5 (OK). The VS-2400CD displays:


Project New
YES
/
NO

Create New Project, Sure?

9. To proceed, press ENTER/YES, or press EXIT/NO to cancel the operation.
   The VS-2400CD asks if you want to store the current project before creating and loading the new one.
10. Press ENTER/YES to save any changes you've made to the currently loaded project, or press EXIT/NO to create and load the new project without saving the old one.

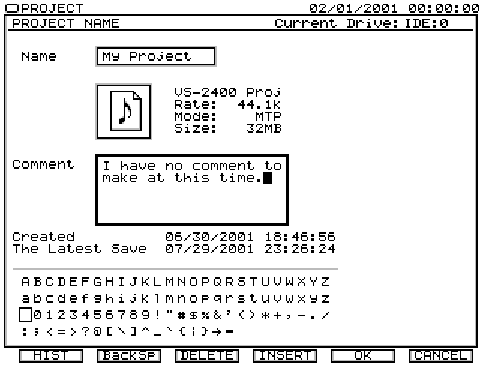
NAME

You can re-name the currently loaded project. On the PROJECT NAME screen, you can also enter a comment about the project and view assorted project information.

Re-Naming a Project

1. Hold down SHIFT and press F1 (PROJECT).
2. If "NAME" isn't visible above F3, press PAGE until it is.
3. Press F3 (NAME)—the PROJECT NAME screen appears.

PROJECT menu F3 (NAME)


PROJECT
02/01/2001 00:00:00
PROJECT NAME
Current Drive: IDE:0
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
a b c d e f g h i j k l m n o p q r s t u v w x y z
0 1 2 3 4 5 6 7 8 9 ! " # $ % & ' ( ) * + , - . /
: ; < = > ? @ [\ ] ^ _ ` { | } → ←
HIST
BackSP
DELETE
INSERT
OK
CANCEL

Name: My Project

VS-2400 Proj
Rate: 44.1k
Mode: MTP
Size: 32MB

Comment: I have no comment to make at this time.

Created 06/30/2001 18:46:56
The Latest Save 07/29/2001 23:26:24

4. Enter the desired name as described in "Naming" on Page 71.

Entering a Project Comment

1. On the PROJECT NAME screen, select the Comment box and enter the desired comment the same way you'd enter a name.

PROTECT

You can lock a project on your hard drive to protect its data from being accidentally overwritten, and to prevent accidental erasure of the project. This is called "write-protecting" a project. You can also unlock a project using the same procedure.

PROJECT menu F4 (PROTEC)

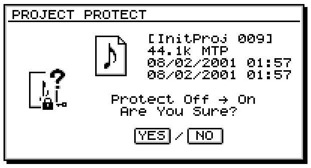
Locking and Un-Locking a Project on Your Hard Drive

These symbols tell you if a project's:

Locked

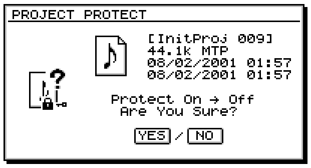
Unlocked

1. Hold down SHIFT and press F1 (PROJECT).
2. If "PROTEC" isn't visible above F4, press PAGE until it is.
3. Select the desired project.
4. Press F4 (PROTEC). Depending on whether the project is currently locked or not, the VS-2400CD asks if you're sure you want to:


PROJECT PROTECT
[InitProj 009]
44.1k MTP
08/02/2001 01:57
08/02/2001 01:57
Protect Off → On
Are You Sure?

…lock the project…

or


PROJECT PROTECT
[InitProj 009]
44.1k MTP
08/02/2001 01:57
08/02/2001 01:57
Protect On → Off
Are You Sure?

…unlock the project.

5. Press ENTER/YES to proceed, or EXIT/NO to cancel the operation.

OPTIMIZE

As described in "UNDO and REDO" on Page 70, the VS-2400CD retains all of your recorded data so that you can undo up to 999 of your most recent actions. A project can grow quite large with audio you don't plan to use.

You can "optimize" a project, deleting from your hard drive all data not currently on a project V-Track. In some cases, this can lead to the recovery of large amounts of drive space. A lean project is also faster to back up, and requires less CD-R/RW disk space.

After you've optimized a project, you can no longer undo actions performed prior to the optimization procedure. Your Undo levels start over again back at Level 1 with the first action taken after the optimization.

You can't use Undo to reverse an optimization procedure.

Optimization on the VS-2400CD is not the same as optimization on a computer. On the VS-2400CD, optimization doesn't defrag your drive (Page 108)—it deletes unwanted files.

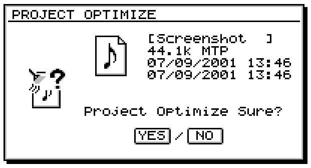
Optimize deletes only unused audio in the selected project. It doesn't affect any audio on any of your V-Tracks, whether the V-Tracks are currently selected or not.

Optimizing a Project

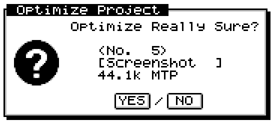
OPTIMZ

PROJECT menu F5 (OPTIMZ)

1. Load the project you want to optimize.
2. Hold down SHIFT and press F1 (PROJECT).
3. If "OPTIMZ" isn't visible above F5, press PAGE until it is.
4. Select the desired project.
5. Press F6 (MARK) to place a checkmark to the left of the project's name, targeting it for optimization.
6. Press F5 (OPTIMZ). The VS-2400CD asks:


PROJECT OPTIMIZE
[Screenshot]
44.1k MTP
07/09/2001 13:46
07/09/2001 13:46
Project Optimize Sure?

7. If you’re sure you want to proceed, press ENTER/YES, or press EXIT/NO to cancel optimization of the displayed project.
   Since you’re about to permanently delete audio data, the VS-2400CD asks again:



```
Optimize Project
      Optimize Really Sure?
      <No.  5>
      [Screenshot  ]
      44.1k MTP
```

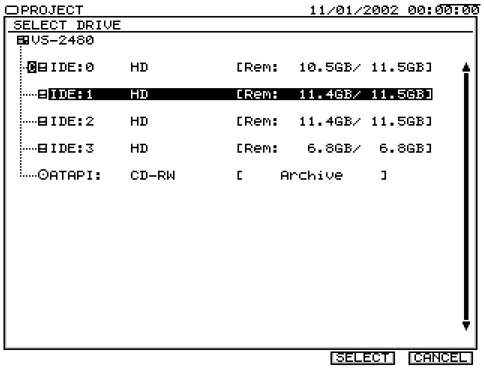
8. Press ENTER/YES to optimize the current project, or EXIT/NO to cancel.

Destination Drive Selection

When you’re moving project data from one place to another—when you’re copying, backing up or exporting project data—you can select the desired destination drive before beginning the operation, as noted in the procedures described later in this chapter. In addition, you’ll see F4 (SelDrv) at the bottom of the operation’s main screen in case you change your mind later and want to select a new destination drive.

Selecting a New Destination Drive

1. Press F4 (SelDrv) to display the SELECT DRIVE screen.



```
PROJECT                          11/01/2002 00:00:00
SELECT DRIVE
VS-2480
  IDE:0     HD        [Rem:  10.5GB/ 11.5GB]
  IDE:1     HD        [Rem:  11.4GB/ 11.5GB]
  IDE:2     HD        [Rem:  11.4GB/ 11.5GB]
  IDE:3     HD        [Rem:   6.8GB/  6.8GB]
  ATAPI:    CD-RW     [    Archive    ]
```

2. Use ▼ or ▲ or the Time/Value dial to highlight the desired drive.
3. Press F5 (OK) to select the drive and return to the project operation’s screen.

COPY

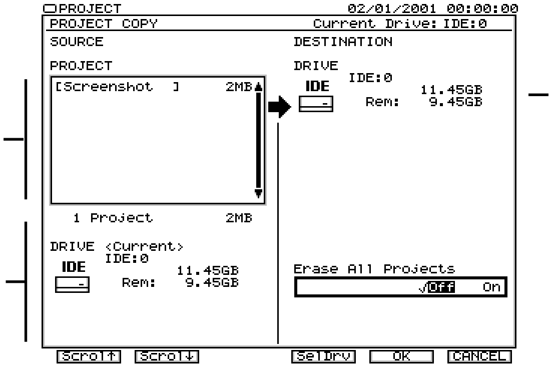
Use the PROJECT menu’s COPY operation to make a copy of a project. You can store the copy in the project’s current drive or in another one, providing the destination drive has enough free space. This can be handy when you want to have a safety copy of a project while you work on the original. It can also be useful if you need to create multiple versions of a project based on the same original work. Finally, it can be helpful if you’re having problems backing up a project.

Copying a Project

PROJECT menu F1 (COPY)

1. Hold down SHIFT and press F1 (PROJECT).
2. Select and mark the project(s) you want to copy.
3. If “COPY” isn’t visible above F1, press PAGE until it is.
4. Mark the project(s) you want to copy.
5. Turn the Time/Value dial to select the drive to which you want to copy the marked project(s).

6. Press F1 (COPY)—the PROJECT COPY screen appears.



PROJECT 02/01/2001 00:00:00
PROJECT COPY Current Drive: IDE:0
SOURCE
PROJECT
[Screenshot] 2MB
1 Project 2MB
DRIVE <Current>
IDE:0
11.45GB
Rem: 9.45GB
DESTINATION
DRIVE
IDE:0
11.45GB
Rem: 9.45GB
Erase All Projects
√Off On

List of projects you've marked

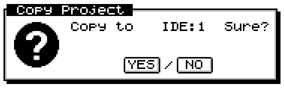
Currently selected drive info

Drive to which data will be copied

Press F2 to scroll down through the list of projects if it extends out of view, or F1 to scroll up the list.

You can wipe the destination drive clean before copying your data to it.

7. Set Erase all Projects to:
   - *Off*—if you want to add what you're copying to the list of projects already on the destination drive.
   - *On*—if you want to clear the drive so it contains only what you're copying.
8. Press F5 (OK)—the VS-2400CD asks:



Copy Project
Copy to IDE:1 Sure?

9. Press ENTER/YES to proceed, or EXIT/NO to cancel the COPY operation.
   If you pressed ENTER/YES, the VS-2400CD asks if you want to store any changes you've made to the currently loaded project before beginning the COPY process.
10. Press ENTER/YES to save your most recent changes to the currently loaded project before copying the marked project(s), or EXIT/NO to simply begin copying.
11. If Erase all Projects is on, the VS-2400CD asks if you're sure you want to erase the destination drive first—press ENTER/YES to do so, or EXIT/NO to cancel copying.

ERASE

You might want to erase a project from your hard drive to gain back free drive space, when you've copied it to another drive, or when you simply no longer want to project.

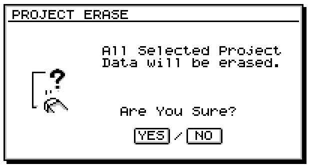
The project ERASE command permanently erases a project from your hard drive. This operation cannot be reversed using the VS-2400CD's Undo feature, so perform it with care.

Erasing a Project

ERASE

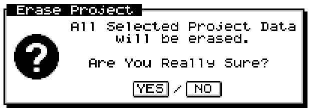
PROJECT menu F2 (ERASE)

1. Hold down SHIFT and press F1 (PROJECT).
2. Select and mark the project—or projects—you want to erase.
3. If "ERASE" isn't visible above F2, press PAGE until it is.
4. Press F2 (ERASE)—the VS-2400CD asks:



PROJECT ERASE
All Selected Project
Data will be erased.
Are You Sure?

5. If you're sure you want to delete the marked project(s) from your hard drive, press ENTER/YES. If not, press EXIT/NO.
6. Since ERASE is irreversible, the VS-2400CD asks again:



Erase Project

All Selected Project Data will be erased.

Are You Really Sure?

7. To erase the marked project(s), press ENTER/YES, or press EXIT/NO to cancel.

SPLIT

SPLIT creates a new project from selected V-Tracks, removing them from the currently loaded project. The new project inherits the original project's settings, including markers, locators, Automix data, the tempo map and sync track, project-related UTILITY menu settings and its name, with a distinguishing last character added. The new project is stored on the same drive as the original project.

Project SPLIT can be handy if you've got a large project with lots of V-Tracks you're not using but don't want to erase. You can split out these V-Tracks to a new project, making the original project smaller and easier to back up.

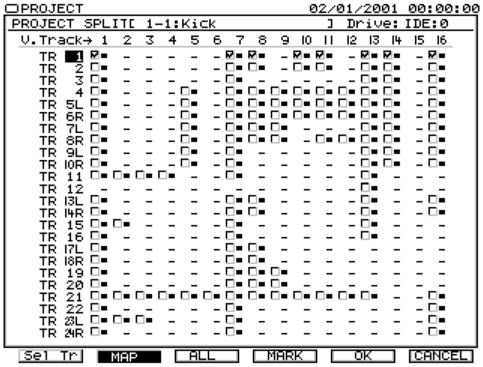
SPLIT cannot be reversed using the VS-2400CD's Undo feature—V-Tracks removed from a project can returned to it only by using the region IMPORT feature. See Page 267.

Project SPLIT uses very little additional space on your hard drive since it's essentially moving data from the original project to the new one, not creating new data.

Splitting a Project

PROJECT menu F3 (SPLIT)

1. Load the project you want to split (Page 91).
2. Hold down SHIFT and press F1 (PROJECT).
3. If "SPLIT" isn't visible above F3, press PAGE until it is.
4. Press F3 (SPLIT)—the VS-2400CD first SPLIT screen appears.



PROJECT 02/01/2001 00:00:00

PROJECT SPLIT[1-1:Kick] Drive: IDE:0

V.Track→	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
TR 1	☑■	-	-	-	-	-	☑■	☑■	-	☑■	☑■	-	☑■	☑■	-	☑■
TR 2	☐■	-	-	-	-	-	☐■	☐■	-	☐■	☐■	-	☐■	☐■	-	☐■
TR 3	☐■	-	-	-	-	-	☐■	-	-	-	-	-	☐■	☐■	-	☐■
TR 4	☐■	-	-	-	☐■	-	☐■	☐■	☐■	☐■	☐■	☐■	☐■	☐■	-	☐■
TR 5L	☐■	-	-	-	☐■	-	☐■	☐■	☐■	☐■	☐■	☐■	☐■	☐■	-	☐■
TR 6R	☐■	-	-	-	☐■	-	☐■	☐■	☐■	☐■	☐■	☐■	☐■	☐■	-	☐■
TR 7L	☐■	-	-	-	☐■	-	☐■	☐■	☐■	-	-	-	☐■	☐■	-	☐■
TR 8R	☐■	-	-	-	☐■	-	☐■	☐■	☐■	-	☐■	☐■	☐■	☐■	-	☐■
TR 9L	☐■	-	-	-	☐■	-	☐■	-	-	-	-	-	☐■	☐■	-	☐■
TR 10R	☐■	-	-	-	☐■	-	☐■	-	-	-	-	-	☐■	☐■	-	☐■
TR 11	☐■	☐■	☐■	☐■	-	-	☐■	-	-	-	-	-	☐■	-	-	-
TR 12	-	-	-	-	-	-	-	-	-	-	-	-	☐■	-	-	-
TR 13L	☐■	-	-	-	-	-	☐■	☐■	-	-	-	-	☐■	-	-	☐■
TR 14R	☐■	-	-	-	-	-	☐■	☐■	-	-	-	-	☐■	-	-	☐■
TR 15	☐■	☐■	-	-	-	-	☐■	-	-	-	-	-	☐■	-	-	-
TR 16	☐■	-	-	-	-	-	☐■	-	-	-	-	-	☐■	-	-	-
TR 17L	☐■	-	-	-	-	-	☐■	☐■	-	-	-	-	-	-	-	-
TR 18R	☐■	-	-	-	-	-	☐■	☐■	-	-	-	-	-	-	-	-
TR 19	☐■	-	-	-	-	-	☐■	☐■	☐■	-	-	-	-	-	-	-
TR 20	☐■	-	-	-	-	-	☐■	☐■	☐■	-	-	-	-	-	-	-
TR 21	☐■	☐■	☐■	☐■	☐■	☐■	☐■	☐■	☐■	☐■	☐■	☐■	☐■	-	-	☐■
TR 22	☐■	-	-	-	-	-	☐■	-	-	-	-	-	-	-	-	☐■
TR 23L	☐■	☐■	☐■	-	-	-	☐■	-	-	-	-	-	-	-	-	☐■
TR 24R	☐■	-	-	-	-	-	☐■	-	-	-	-	-	-	-	-	☐■

You can mark V-Tracks on SPLIT's V-Track MAP screen—shown above—or on its Select Track screen. You can mark as many V-Tracks as you want on either screen.

In the map of the project's V-Tracks, any V-Track that contains data appears as a small black box with a checkbox to its left.

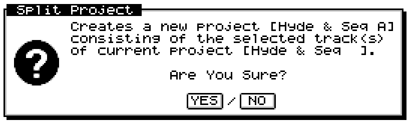
5. To select a V-Track, cursor to it and press F4 (MARK) to check its checkbox; to unselect it, press F4 (MARK) again. You can select and unselect all of the V-Tracks in the map at once by repeatedly pressing F3 (ALL).

To quickly select or unselect one track's entire set of V-Tracks, cursor all the way to the left so that the track's name is highlighted and press F4 (MARK).

6. If you prefer to work on the Select Track screen, press F1 (SelTrk).
7. To select a V-Track for export on the Select Track screen, turn the Time/Value dial to highlight the V-Track and press F4 (MARK) to place a checkmark next it.

Hold down SHIFT as you turn the Time/Value dial to jump between same-numbered V-Tracks on different tracks.

8. When you've selected all of the desired V-Tracks, press F5 (OK). The VS-2400CD asks:



Creates a new project [Hyde & Seq A]
consisting of the selected track(s)
of current project [Hyde & Seq].

Are You Sure?

9. Press ENTER/YES to proceed, or EXIT/NO to cancel the operation.
10. If you pressed ENTER/YES, the VS-2400CD asks if you want to save recent changes to the currently loaded project before proceeding.
11. Press ENTER/YES to save the project's recent changes before performing the split, or EXIT/NO to skip directly to splitting the project.

COMBINE

Project COMBINE—as its name suggests—allows you to append a project from your hard drive onto the end of the currently loaded project. You can use COMBINE to collect, one-by-one, individual projects into one large project. You might want to, for example, do this when assembling the songs for an album if each song has been recorded as a separate project—see "Multi-Project Compilation CDs" on Page 331.

Only projects that share the same sample rate and recording mode can be combined.

How COMBINE Works

- The project that's added to the end of the currently loaded project is placed four seconds after the end of the current project's last audio.
- A new marker is automatically placed at the start of the newly appended material.
- The appended project's track and V-Track assignments are preserved in the new combined project.
- The appended project is no longer on your hard drive as a separate project since its data is now part of the new combined project.

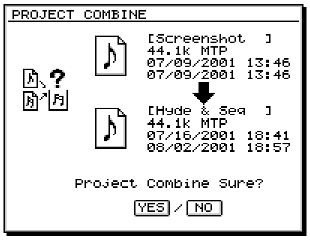
Some aspects of appended project are not carried over into the currently loaded project, such as markers, locators, Automix data, the tempo map and sync track, and project-related UTILITY menu settings.

Combining Two Projects

Since COMBINE alters both projects, we recommend you back both of them up before performing the COMBINE operation.

PROJECT menu
F4 (COMBIN)

1. Load the project you want to use as the basis for the final project.
2. Hold down SHIFT and press F1 (PROJECT).
3. Select the project you want to add to the end of the loaded project.
4. If "COMBIN" isn't visible above F4, press PAGE until it is.
5. Press F4 (COMBIN)—the VS-2400CD asks:

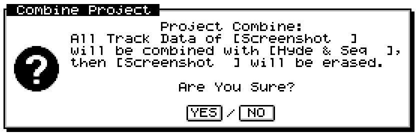


[Screenshot]
44.1k MTP
07/09/2001 13:46
07/09/2001 13:46

[Hyde & Seq]
44.1k MTP
07/16/2001 18:41
08/02/2001 18:57

Project Combine Sure?

6. Press ENTER/YES to proceed with the combining of the two projects, or press EXIT/NO to cancel the operation.
7. If you pressed ENTER/YES, the VS-2400CD asks again if you're really sure:



Project Combine:
All Track Data of [Screenshot]
will be combined with [Hyde & Seq],
then [Screenshot] will be erased.

Are You Sure?

8. Press ENTER/YES to proceed, or EXIT/NO to cancel.
   The VS-2400CD asks if you want to save any changes you've made to the currently loaded project before proceeding.
9. Press ENTER/YES to store the current project's changes, or press EXIT/NO to skip directly to the combining of the two projects.

BACKUP

We strongly recommend that you back up your projects regularly. When you back up a project, you make a copy of it on a CD-R or CD-RW, and store the backup in a safe, separate place. Though your VS-2400CD is an extremely reliable device, unexpected events—including power outages and worse—*can* occur during its operation. The only way to guarantee that your work remains safe is to back it up.

You can re-load a project backup at any time by performing a RECOVER operation—see Page 103.

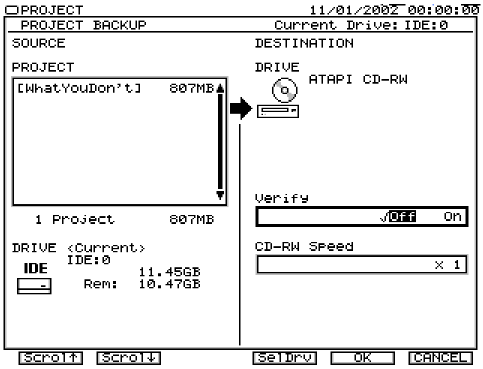
Backing Up a Project

1. Insert the desired CD-R or CD-RW into your CD-R/RW drive.

The BACKUP operation re-formats the destination media for backup use. The media, therefore, doesn't need to be formatted ahead of time.

2. Hold down SHIFT and press F1 (PROJECT).
3. Mark the project(s) you want to back up.
4. If "BACKUP" isn't visible above F1, press PAGE until it is.
5. Press F1 (BACKUP)—the PROJECT BACKUP screen appears.

PROJECT menu F1 (BACKUP)



PROJECT 11/01/2002 00:00:00
PROJECT BACKUP Current Drive: IDE:0
SOURCE
PROJECT
[WhatYouDon't] 807MB
1 Project 807MB
DRIVE <Current> IDE:0
IDE 11.45GB
Rem: 10.47GB
DESTINATION
DRIVE ATAPI CD-RW
Verify √Off On
CD-RW Speed x 1

List of projects you've marked

Currently selected drive info

Drive to which data will be backed up

Press F2 to scroll down through the list of projects if it extends out of view, or F1 (Scrol) to scroll up through the list.

6. Select whether or not you'd like the VS-2400CD to verify the accuracy of your backup once it's been written on the CD. While this causes the backup to take a bit longer, we recommend turning Verify on to make absolutely sure your project data's been correctly backed up.
7. Select the CD burner's write speed. The VS-2400CD offers you only speeds supported by the drive. We recommend trying the MAX setting that uses your drive's fastest supported speed. If you experience any problems, try a lower speed.
8. Press F5 (OK).
   The VS-2400CD asks if you want to save any recent changes to the currently loaded project before proceeding with the backup.
9. Press ENTER/YES to save your currently loaded project before proceeding with the backup, or EXIT/NO to skip straight to the backup.
   If you're using a CD-RW disc that already contains data, the VS-2400CD asks if you want to erase the disk. For details on the messages that may appear, see Page 342.
10. Press ENTER/YES to erase the CD-RW, or EXIT/NO to cancel the backup.
    If a project is too large to fit on the medium you're using, the VS-2400CD asks you for additional media as needed.

During a multi-CD backup, the VS-2400CD asks for each disk twice: once to label the disk, and once to actually write data on the disk.

11. Insert the requested media and press ENTER/YES, or press EXIT/NO to abort the procedure.
12. If you're backing up multiple projects, the VS-2400CD backs up each one in turn.

Project backup data cannot be played as is. To play the project, use project RECOVER to restore the project to your hard drive in playable form.

RECOVER

To re-load VS-2400CD project backup data, use the RECOVER operation. When you recover a project, the project is restored to your internal hard drive in its original state.

RECOVER is available only when the selected drive contains project backup data.

Recovering Backup Data

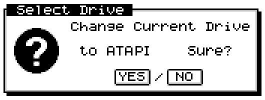
Recovr

PROJECT menu F2 (Recovr)

1. Hold down SHIFT and press F1 (PROJECT).
2. Insert the CD containing the backup into your CD-R/RW drive.

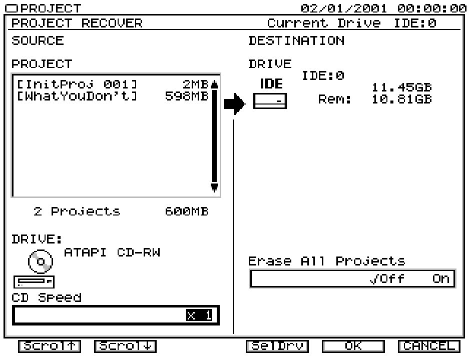
If the project is backed up on more than one disk, insert the first disk containing backup data.

3. Select the drive containing the project backup data.
4. Press F6 (LIST) to view the drive's contents. The VS-2400CD displays:


Select Drive
Change Current Drive
to ATAPI Sure?

New drive's name

5. Press ENTER/YES to continue, or EXIT/NO to cancel the drive change.
6. Mark the project(s) you want to recover.
7. Turn the Time/Value dial to select the drive to which you want to recover the marked backup data.
8. If "Recovr" isn't visible above F2, press PAGE until it is.
9. Press F2 (Recovr)—the PROJECT RECOVER screen appears.


PROJECT 02/01/2001 00:00:00
PROJECT RECOVER Current Drive IDE:0
SOURCE
PROJECT
[InitProj 001] 2MB
[WhatYouDon't] 598MB
2 Projects 600MB
DRIVE: ATAPI CD-RW
CD Speed x 1
DESTINATION
DRIVE IDE IDE:0 11.45GB
Rem: 10.81GB
Erase All Projects √Off On

List of project backup data you've marked

Drive containing backup

Drive to which data will be recovered

Press F2 to scroll down through the list of project backup data if it extends out of view, or F1 (Scrol) to scroll up through the list.

10. Set Erase all Projects to:
    - *Off*—if you want to add the project(s) you're recovering to the list of projects already on the destination drive.
    - *On*—if you want to clear the drive so it contains only your recovered projects.
11. Set the desired CD drive speed. Try MAX. If you experience problems recovering the data, try a lower speed.
12. Press F5 (OK). The VS-2400CD asks if you want to save the currently loaded project.
13. Press ENTER/YES to save the loaded project before the recovery operation, or press EXIT/NO to go straight to recovery.
    The VS-2400CD asks if you're sure you want to proceed with the recovery.
14. Press ENTER/YES to continue the recovery, or EXIT/NO to cancel.
15. If Erase All Projects is on, the VS-2400CD asks if you're sure you want to erase the destination drive first—press ENTER/YES to do so, or EXIT/NO to cancel recovery.
16. If the backup is larger than a single disk, the VS-2400CD asks for additional disks as needed. Insert each requested disk in your drive and press ENTER/YES to proceed.

IMPORT

You can use project IMPORT to restore song backup and archive data from the:

- VS-880
- VS-890
- VS-2480/VS-2480CD
- VS-880EX
- VS-1680
- VSR-880
- VS-1880

When you import a song from an earlier V-Studio, the VS-2400 converts it into a VS-2400 project. You can recover backed-up song data from a CD. After the VS-2400 imports the song, it's loaded as the current project. If you're importing multiple songs, the last song the VS-2400 imports becomes the current project..

See "V-Studio Song/VS-2400CD Project Compatibility" on Page 466 for details on how other V-Studios' songs are transformed into VS-2400CD projects.

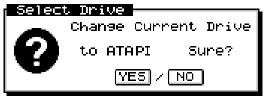
You can't import songs from the VS-1680 or VS-1880 by installing their internal hard drives in the VS-2400CD. The VS-2400CD utilizes a different type of drive format.

To import a VS-840 song, use the VS-840's Song Convert operation to convert it first into VS-880 format, and then import the song into the VS-2400CD. Only the song's audio and track assignments are imported—all other settings must be recreated manually.

Importing a Song from an Earlier V-Studio

PROJECT menu F3 (IMPORT)

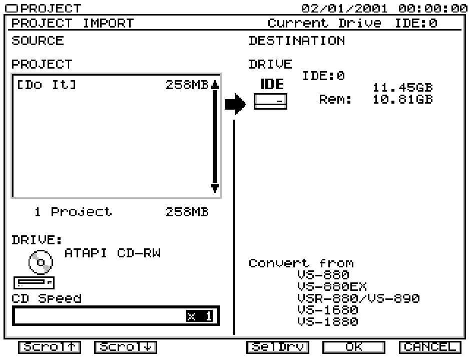
1. Insert the CD containing the backed-up song data into your CD-R/RW drive.
2. Hold down SHIFT and press F1•PROJECT.
3. Select the device containing the song data.
4. Press F6 (LIST). The VS-2400CD displays:


Select Drive
YES
NO

Change Current Drive to ATAPI Sure?

New drive's name

5. Press ENTER/YES to change drives, or EXIT/NO to cancel the drive change.
6. Mark the song(s) you want to import.
7. Select the drive to which you want to import the song.
8. If "IMPORT" isn't visible above F3, press PAGE until it is.
9. Press F3 (IMPORT)—the PROJECT IMPORT screen appears.


PROJECT
02/01/2001 00:00:00
PROJECT IMPORT
Current Drive IDE:0
SOURCE
DESTINATION
PROJECT
DRIVE
[Do It]
258MB
IDE
IDE:0
11.45GB
Rem: 10.81GB
1 Project
258MB
DRIVE:
ATAPI CD-RW
CD Speed
x 1
Convert from
VS-880
VS-880EX
VSR-880/VS-890
VS-1680
VS-1880
Scrol↑
Scrol↓
SelDrv
OK
CANCEL

List of song data you've marked

Drive containing song data

Drive to which data will be imported

Press F2 to scroll down through the list of songs if it extends out of view, or F1 (Scrol) to scroll up through the list.

10. Press F5 (OK) to import the marked songs—the VS-2400CD asks if you're sure.
11. Press ENTER/YES to start importing, or EXIT/NO to cancel the operation.
    The VS-2400CD imports the selected song data. Depending on the amount of data, and the amount of conversion required, this can take a while.

EXPORT

You can export the current project from the VS-2400CD so that it can be played on the:

- VS-880
- VS-890
- VS-2480/VS-2480CD
- VS-880EX
- VS-1680
- VSR-880
- VS-1880

The VS-2400CD won't export a project directly to the VS-840's data format. You can export a project as VS-880 data, and use the VS-840's Song Convert feature to load the data.

How Export Works

This section describes how the currently loaded VS-2400CD project is translated for export to the various V-Studios. In all cases, when you export a VS-2400CD project, the newly created song uses the project's sample rate and recording mode.

The VS-2400CD's M16 recording mode is the same as the MAS mode in the VS-880, VS-880EX, VSR-880, VS-890, VS-1680 and VS-1880. The VS-2400CD's M16 recording mode is identical to the one in the VS-2480 and VS-2480CD.

You can export a project to CD-R/RW as a song archive for earlier V-Studios and as a backup for the VS-2480/VS-2480CD.

Exporting to a VS-880 or VS-880EX

- Eight project tracks are exported. You can select Tracks 1-8, 9-16 or 17-24.
- Only V-Tracks 1-8 are exported to VS-880 songs—to export data on V-Tracks 9-16, copy the data to V-Tracks 1-8. In VS-880EX songs, the VS-2400CD's V-Tracks 1-8 are exported to Bank A, and V-Tracks 9-16 to Bank B.
- Only the project's Locators 00-31 are exported.
- Projects that use the M24, MTP, CDR and LV2 recording modes can't be exported as VS-880 or VS-880EX songs.

Exporting to a VS-890 or VSR-880

- Eight project tracks are exported. You can select Tracks 1-8, 9-16 or 17-24.
- V-Tracks 1-8 are exported to Bank A, and V-Tracks 9-16 to Bank B.
- Projects that use the M24 and LV2 recording modes can't be exported as VS-890 or VSR-880 songs.
- MTP-recorded project data is converted to VSR mode during export—this process can take a while.

Exporting to a VS-1680

- 16 project tracks are exported. You can select Tracks 1-16 or 9-24.
- Only the project's Locators 00-63 are exported.
- Projects that use the M24 and CDR recording modes can't be exported as VS-1680 songs, nor can projects that contain CDR mastering tracks—see Page 330.

Exporting to a VS-1880

- 18 project tracks are exported. You can select Tracks 1-18 or 7-24.
- Only the project's Locators 00-63 are exported.
- Projects that use the M24 recording mode can't be exported as VS-1880 songs.

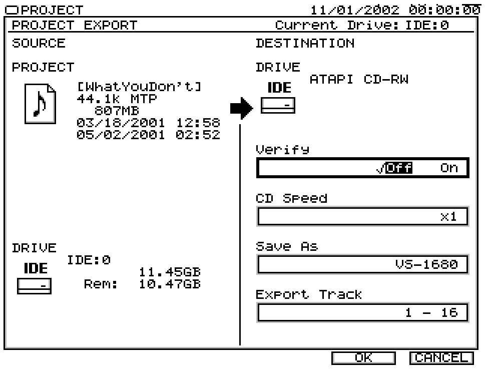
Exporting to a VS-2480/VS-2480CD

- RSS PAN settings and V-Link Automix data are discarded when a VS-2400CD project is exported as a VS-2480 project.

Exporting a VS-2400CD Project

PROJECT menu
F4 (EXPORT)

1. Load the desired project into the VS-2400CD.
2. Hold down SHIFT and press F1 (PROJECT).
3. If “EXPORT” isn’t visible above F4, press PAGE until it is.
4. Press F4 (EXPORT). The PROJECT EXPORT screen appears.



```
PROJECT                              11/01/2002 00:00:00
PROJECT EXPORT                   Current Drive: IDE:0
SOURCE                           DESTINATION

PROJECT                          DRIVE
        [WhatYouDon't]             IDE   ATAPI CD-RW
        44.1k MTP
          807MB
        03/18/2001 12:58
        05/02/2001 02:52
                                 Verify
                                                 √Off    On
                                 CD Speed
                                                         x1
DRIVE                            Save As
 IDE    IDE:0                                       VS-1680
                 11.45GB
         Rem:    10.47GB         Export Track
                                                     1 - 16
```

5. Set the Verify and CD Speed parameters:
    - Verify’s setting determines whether or not the VS-2400CD double-checks the accuracy of the data it writes on your CD. Turning Verify on is always the safest method, though it does cause the export to take a little longer.
    - CD Speed—sets the speed at which the exported data is written to the CD. Try the MAX setting to make the EXPORT process faster. If you experience problems, try a slower setting.
6. Set the Save As parameter to select the type of V-Studio data the VS-2400CD exports.
7. Export Track determines which of the project’s tracks are exported.
8. Press F5 (OK). The VS-2400CD asks if you want to save any recent changes you’ve made to the current project before proceeding.
9. Press ENTER/YES to save any recent changes, or EXIT/NO to skip to exporting. If you’re using a CD-RW disc that already contains data, the VS-2400CD asks if you want to erase the disk. For details on the messages that may appear, see Page 342.
10. If a project is too large to fit on the medium you’re using, the VS-2400CD asks you for additional media as needed. Insert the requested media and press ENTER/YES, or press EXIT/NO to abort the procedure.

During a multi-CD export operation, the VS-2400CD asks for each disk twice: once to label the disk, and once to actually write data on the disk.

Drive Operations

A reminder: each disk drive partition appears in the VS-2400CD's project list as a separate drive. As we noted in Chapter 6, when we refer to a "drive," we mean a partition. When we refer to an entire hard drive mechanism, we call it a "hard drive." This distinction is *very* important to remember in the following sections.

Before proceeding with the PROJECT menu's hard drive- and drive-related operations, here's some information about keeping your hard drive operating at its best.

Disk Maintenance

As with any piece of sophisticated electronic equipment, you hard drive requires a bit of maintenance from time to time in order to perform at its best.

When you shut down the VS-2400CD correctly (Page 78)—instead of just switching it off—you're performing simple everyday maintenance, letting the VS-2400CD properly conclude disk operations, storing your latest work safely on the currently selected drive before shutting down.

In addition, you'll want to make sure your hard drive doesn't begin to show signs of "fragmentation," which can slow down the VS-2400CD and cause other problems.

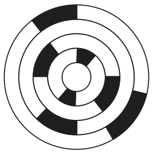
Fragmentation

What Is Fragmentation?

When a hard drive has first been set up and has lots of free space, your VS-2400CD can write each file's data in one single, continuous area of the hard drive. When the file is played back, the VS-2400CD only has to look in one place to find all the necessary data.

When a hard drive has been in use for a while, however, the empty spaces for writing new data become smaller and smaller. This occurs for a few reasons:

- There's simply less free space.
- New data for each project may be written far away from the rest of the project data when you've got several projects taking up space on the hard drive.
- When you optimize a project (Page 96) to free up disk space, small chunks of unwanted data are discarded, leaving small areas of free space.



With fragmentation, little bits and pieces of a file are written all over the drive.

When the VS-2400CD stores new files, it squeezes them into any bits of space it can find. As a result, the data winds up scattered all over the hard drive. When the data is stored in such little bits and pieces, the hard drive is said to be "fragmented."

When the VS-2400CD plays back a file from a fragmented hard drive, it has to grab a little piece from here, another piece from there and so on. This is much harder than simply playing one continuous chunk from a single hard drive location, and it takes more time. This can slow things down unacceptably and lead to errors during playback, recording or backup.

Fragmentation is a naturally occurring process for a hard drive used with any computer or recording device. Hard drives that record audio are especially prone to fragmentation due to the stop-and-start nature of recording.

How Can I Prevent Fragmentation?

We strongly recommend you perform the following three-step procedure, in order, once a month to eliminate any fragmentation on your hard drive before it starts causing problems:

1. Back up all of the projects stored in the hard drive, as described on Page 101.
2. Perform a Format Drive operation (Page 108) with Physical Format turned on.
3. Recover your projects to the hard drive (Page 103).

When you format a hard drive, you erase all of the data on it, in all of its partitions. *Do not* format your hard drive until you've backed up every one of its projects—see "BACKUP" on Page 101.

Is My Hard Drive Fragmented?

Your hard drive may be fragmented if:

- you experience "Drive Busy!" messages.
- you hear pops and clicks when you play back a project.
- the VS-2400CD's transport begins to feel sluggish as you navigate a project.

What Can Be Done About a Fragmented Hard Drive?

You can de-fragment—or "defrag"—your hard drive using the same three steps we listed in "How Can I Prevent Fragmentation?"

If you have trouble backing up a project, it may be because it's just too fragmented. Perform the following actions, in order:

1. Optimize the project (Page 96).
2. After optimization, copy the project to another drive, preferably one that's less crowded with project data (Page 97).
3. Back up the copy and perform the steps in "How Can I Prevent Fragmentation?" on the previous page.

If you have trouble backing up the copied project, try lowering the CD speed.

Format Drive

When you format a hard drive, you erase all of the information currently on it, and prepare it for use by the VS-2400CD. Formatting completely wipes clean all of the hard drive's partitions. You'd format a hard drive:

- after backing up all of its projects during your monthly hard drive maintenance, as described in "How Can I Prevent Fragmentation?" on Page 108.
- when you're de-fragging a hard drive after backing up all of the projects on it.

When a hard drive is formatted for use with the VS-2400CD, it can't be used by another device.

What Gets Formatted

When you format a drive, all of its contents are erased. If the drive has multiple partitions—as your internal hard disk does—they're all wiped clean of data.

About Partition Sizes

To learn about partitions, see "How a VS-2400CD Hard Drive Organizes Data" on Page 83.

When you format a hard drive, you're asked to decide the size of its drives/partitions. The VS-2400CD offers you four choices:

- 500MB
- 1GB
- 2GB
- 10GB

"MB" is short for megabytes, one million bytes.

We recommend you select a 10GB partition size when you format a hard drive for use with the VS-2400CD—a 10GB partition provides plenty of room for the VS-2400CD's 24-track projects. The other sizes are provided mainly for their familiarity to users of earlier V-Studios.

Formatting a Hard Drive

Back up all data on the hard drive before formatting. Formatting erases all of the data on the hard drive, and the data cannot be recovered using Undo or any other method.

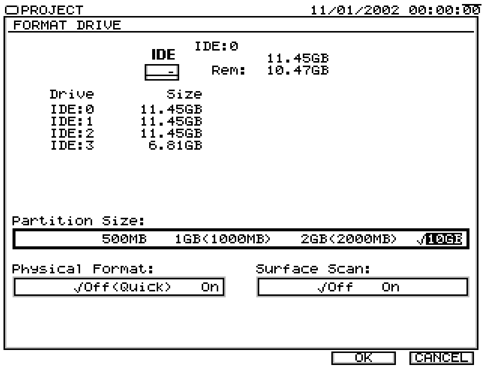
If you accidentally delete data, that data cannot be restored to its previous state. Roland Corporation assumes no liability concerning such loss of data.

The Format Drive operation is available only when a drive is selected.

When you select a drive for formatting, you're really selecting its entire hard drive, all of whose partitions are erased during formatting.

PROJECT menu F2 (FmtDrv)

1. Hold down SHIFT and press F1 (PROJECT).
2. Select a drive belonging to the hard drive you want to format.
3. If "FmtDrv" isn't visible above F2, press PAGE until it is.
4. Press F2 (FmtDrv)—the FORMAT DRIVE screen appears.



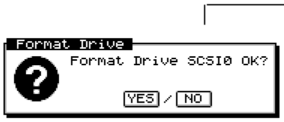
```
PROJECT                              11/01/2002 00:00:00
FORMAT DRIVE
                    IDE    IDE:0
                                      11.45GB
                             Rem:     10.47GB
    Drive         Size
    IDE:0       11.45GB
    IDE:1       11.45GB
    IDE:2       11.45GB
    IDE:3        6.81GB

Partition Size:
            500MB   1GB(1000MB)   2GB(2000MB)   √10GB
Physical Format:                  Surface Scan:
       √Off(Quick)   On                 √Off    On
                                              OK    CANCEL
```

Information about the drive you've selected.

5. Select the desired partition size. We recommend 10GB.

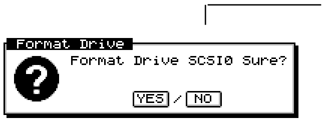
6. Set Physical Format to:
   - *Off (Quick)*—for faster formatting if you're re-formatting a VS-2400CD hard drive just to clear it quickly.
   - *On*—if the hard drive is being formatted for the VS-2400CD for the first time or during your monthly maintenance. If you have time—Physical Format extends the formatting process considerably (40 minutes or more)—use Physical Format to absolutely eliminate any lingering data corruption.
7. Set Surface Scan to:
   - *Off*—to skip a check of the hard drive platters' surfaces during formatting.
   - *On*—so that it checks the surfaces of the hard drive's platters by performing an automatic read/write test after formatting. This can take a while (30 minutes or more), but it's a good thing to do periodically.
8. Press F5 (OK). The VS-2400CD asks if you're sure you want to format the hard drive:



Format Drive SCSI0 OK?

Selected drive

9. Press ENTER/YES to proceed with the formatting, or EXIT/NO to cancel. If you pressed ENTER/YES, the VS-2400CD double-checks to make sure you want to proceed, since you're about to erase everything that's on the selected hard drive.



Format Drive SCSI0 Sure?

Selected drive

10. Press ENTER/YES to proceed with formatting, or EXIT/NO to cancel the operation. If you pressed ENTER/YES, the VS-2400CD asks if you want to save any recent changes to the currently loaded project.
11. Press ENTER/YES to save the project, or EXIT/NO to proceed without doing so. Depending on your Physical Format and Surface Scan settings, formatting can take anywhere from a few moments to several hours.

Do not interrupt the formatting operation before it's finished.

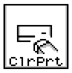
Clear Partition

You can erase, or "initialize," the contents of a single drive—a partition—to make room for new projects. The PROJECT menu's Clear Partition operation performs this task.

Clearing a drive has no effect on fragmentation. Only backing up your projects and re-formatting a hard drive can de-frag it.

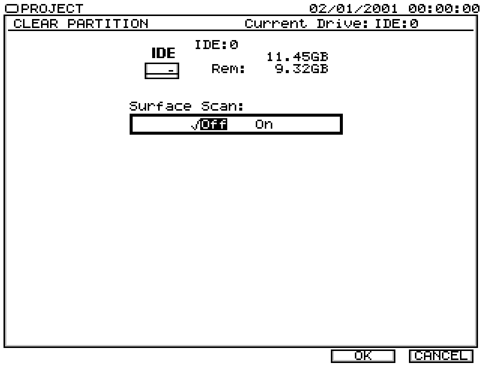
Clearing a Drive/Partition

1. Hold down SHIFT and press F1 (PROJECT).
2. Select the drive you wish to clear.
3. If "ClrPrt" isn't visible above F3, press PAGE until it is.



PROJECT menu F3 (ClrPrt)

4. Press F3 (ClrPrt)—the appears.



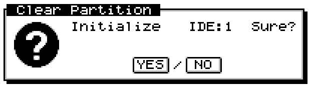
```
PROJECT                              02/01/2001 00:00:00
CLEAR PARTITION          Current Drive: IDE:0
            IDE:0
      IDE              11.45GB
              Rem:      9.32GB

      Surface Scan:
            √Off    On
```

Information about the selected drive/ partition

5. Set Surface Scan to:
   - *Off*—to skip a check of the platter surface in the partition's area of the hard drive during initialization.
   - *On*—so that it checks the platter surface by performing an automatic read/write test after initialization. This can take a while, but it's a good thing to do periodically.
6. Press F5 (OK). The VS-2400CD asks if you're sure you want to clear selected drive:

Selected drive

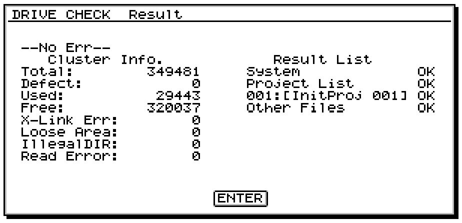


```
Clear Partition
   Initialize    IDE:1   Sure?
```

7. Press ENTER/YES to clear the drive, or EXIT/NO to cancel.
   If you pressed ENTER/YES, the VS-2400CD double-checks to make sure you want to proceed, since you're about to wipe everything on the selected drive/partition.
8. If you want to proceed, press ENTER/YES. To cancel the operation, press EXIT/NO.
9. If you pressed ENTER/YES, the VS-2400CD asks if you want to save any recent changes to the currently loaded project.
10. Press ENTER/YES to save the project before clearing the drive, or EXIT/NO to proceed without doing so.

Drive Check

If you're experiencing problems loading a project, copying it or backing it up, you can run a Drive Check operation to determine if the problem is with your data—if not, you may have a connection problem or a hardware malfunction. Drive Check examines the directory that keeps track of where your files are, and seeks out potential problems with your data. When it's done, it displays a report of its findings.



```
DRIVE CHECK  Result

 --No Err--
    Cluster Info.              Result List
 Total:          349481    System              OK
 Defect:              0    Project List        OK
 Used:            29443    001:[InitProj 001]  OK
 Free:           320037    Other Files         OK
 X-Link Err:          0
 Loose Area:          0
 IllegalDIR:          0
 Read Error:          0
```

Drive Check found no problems with this drive.

Understanding the Drive Check Report

The most important part of the Drive Check Report is the line at its top left that either says "No Err"—as in the illustration above—or "(x) Err," where "x" equals the number of errors found. If Drive Check does find errors, it lists them in the report—turn the Time/Value dial to view them. Items marked with "OK" have no problems.

Here's what some of the terms in the report mean:

- *Cluster*—the smallest chunk of disk data the VS-2400CD reads and writes.
- *Cross link (X-Link)*—a case in which audio from one project is mistakenly referenced by another. This may cause one project's audio to be heard during playback of another.
- *Loose Area*—a chunk of orphaned audio data not associated with any project.
- *Directories*—the list of each drive's files and where they're located on the disk. If a directory becomes confused or damaged, you may see "IllegalDIR" error messages.

This:	*Refers to:*
Total	Total number of clusters
Defect	Number of damaged or unusable clusters
Used	Number of clusters in use
Free	Number of clusters not yet used
X-Link Err	Number of cross links
Loose Area	Number of orphaned clusters
Illegal Dir	Number of directories with incorrect information
Read Error	Number of data-reading problems during the check

About Drive Check's Repair Capabilities

If Disk Check finds a problem it can attempt to fix it for you by deleting the data that's causing the trouble you're experiencing. Often—once the damaged data is removed—the problems that led you to Drive Check disappear.

After Drive Check resolves a problem, we recommend backing up all of your data, re-formatting the drive and recovering the backed-up data to ensure that no lingering problems remain.

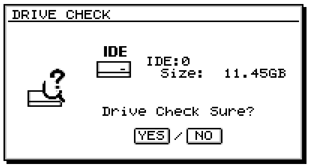
When you begin a Drive Check repair, the VS-2400CD warns you that you'll lose data. The fact is that the data you'll lose is no longer any good anyway, as evidenced by the fact that you've been experiencing problems and that Drive Check has targeted the data for deletion.

Running Drive Check

1. Hold down SHIFT and press F1 (PROJECT).
2. Select the drive you want to check.
3. If "DrvChk" isn't visible over F1, press PAGE until it is.

PROJECT menu
F1 (DrvChk)

4. Press F1 (DrvChk). The VS-2400CD asks:



DRIVE CHECK

IDE:0
Size: 11.45GB

Drive Check Sure?

5. Press ENTER/YES to check the selected drive, or EXIT/NO to cancel.
   The VS-2400CD asks if you want to save any recent changes to the current project.
6. Press ENTER/YES to save the project, or EXIT/NO to proceed to the Drive Check.
   The Drive Check can take a while, depending on the size of your drive.

You can cancel the Drive Check at any time by pressing EXIT/NO. Do not interrupt Drive Check by turning off the VS-2400CD's power.

When the check is complete, the VS-2400CD displays a report of the results.

7. If errors have been found, press ENTER/YES to have Drive Check attempt to remove the cause of the problem from your drive, or press EXIT/NO to cancel Drive Check.

If you're concerned about the risks of proceeding and would like some guidance, give our Product Support team a call at 323-890-3740, x3741 from 8:30am to 5pm PST, Monday-Friday.

The VS-2400CD warns you: "You'll Lose Data," but, as noted above, any data Drive Check wants to remove is probably unusable anyway.

8. Press ENTER/YES to proceed, or EXIT/NO to cancel the operation.
   When Drive Check has finished its repair, it displays what it's done. Projects that've been partially altered are indicated by "Alt," and projects that have been completely deleted are shown as "Del."

8—The Home Screen

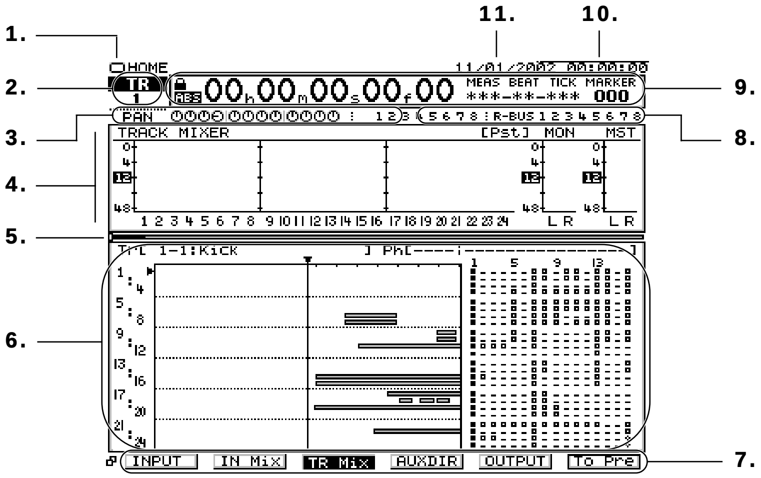
The Home screen is central to VS-2400CD operations. It's one screen every VS-2400CD user needs to master:

- It's the first screen you see when you power up the VS-2400CD.
- It provides you a comprehensive overview of the current project.
- It serves as your home base, no matter what you're doing on the VS-2400CD.

We call it the "Home" screen because it provides a great place to return to if you get confused navigating the VS-2400CD's many displays. Should this ever happen, press HOME•DISPLAY to return to the familiar Home screen and regain your bearings.

Elements of the Home Screen

You can change the appearance of the Home screen to suit the way you work, and for certain specific operations—we'll discuss the possibilities later in this chapter. When you first turn on the VS-2400CD, the Home screen contains the following elements:

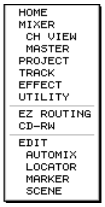

1.
2.
3.
4.
5.
6.
7.
8.
9.
10.
11.
HOME
11/01/2007 00:00:00
TR 1
ABS 00h 00m 00s 00f 00
MEAS BEAT TICK MARKER
-**- 000
PAN
R-BUS
TRACK MIXER
[Pst] MON MST
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 L R L R
1-1:Kick
INPUT
IN Mix
TR Mix
AUXDIR
OUTPUT
To Pre

1. **Display Pop-Up Menu button**
2. **Current channel display**
3. **PAN knobs**
4. **Meters display**
5. **Position bar**
6. **Playlist area**
7. **Meter switches**
8. **Input peak indicators**
9. **Current time location display**
10. **Clock**
11. **Calendar**

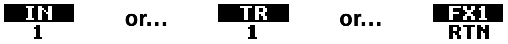
Numbers 1-3 and 8-11 in the above illustration appear on a variety of VS-2400CD screens. The descriptions in the following pages explain how they work.

Display Pop-Up Menu Button

Click the small rectangle in the upper left corner of the Home screen to view the Display Pop-Up menu, described on Page 69.


HOME
MIXER
CH VIEW
MASTER
PROJECT
TRACK
EFFECT
UTILITY
EZ ROUTING
CD-RW
EDIT
AUTOMIX
LOCATOR
MARKER
SCENE

Current Channel Display

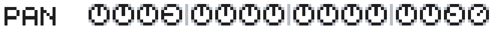

IN
1
or...
TR
1
or...
FX1
RTN

The current channel display shows you the name of the input, track or FX return channel that's most recently been selected for editing ("Selecting a Channel for Editing" on Page 134).

There's *always* an input, track, Aux master or FX return channel selected in the VS-2400CD, even if you've just powered up and haven't manually selected one. After power-up, Track Channel 1 is selected.

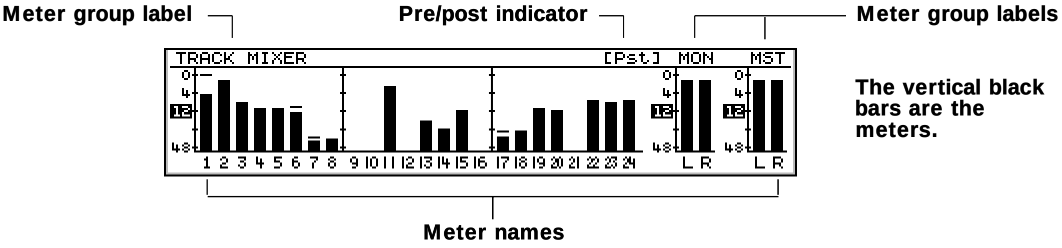
As described on Page 69, you can click on a channel's name in the current channel display to access the Channel Pop-Up menu.

PAN Knobs



The PAN knobs show the PAN settings in the MASTER mix for the channels currently selected with the FADER buttons (Page 134). You can drag any of these virtual knobs left or right to shift the corresponding channel's signal leftward or rightward, respectively.

Meters Display


Meter group label
Pre/post indicator
Meter group labels
TRACK MIXER
[Pst]
MON
MST
0
4
12
48
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
L R
L R
The vertical black bars are the meters.
Meter names

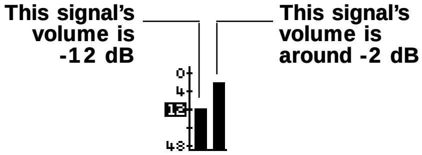
The meters display shows the levels of your signals. The meter switches at the bottom of the display select the signals to be displayed—they're described on Page 120. In the illustration above, F3 (TR Mix), for "Track Mixer," has been pressed and is currently highlighted at the bottom of the display (not shown).

The meters display often shows the meters for more than one set of signals at a time, as in the illustration above. Each group of meters is labeled—the label appears just above the meters. The numbers at the bottom of the meters display identify each meter's signal. In this illustration, the meters to the left are showing the levels of the 24 tracks. The meters to the right show the levels of the stereo MONITOR and MASTER busses.

The meters display can be replaced by the fader/pan display, described on Page 123. If the meters display isn't visible, press PAGE on the VS-2400CD until the meter switches appear, and then select the desired meters' display view (Page 120).

How the VS-2400CD Meters Show Signals

Levels are shown on the VS-2400CD's display in a row of vertically oriented meters. Each meter's signal is shown as a thick black bar that grows taller as its signal gets louder. The 48, 12, 4 and 0 markings to the left of the meters show you how loud the signal is in dBs— -48 dB, -12 dB, -4 dB and 0 dB—as the black bar varies in height.



This signal's volume is -12 dB

This signal's volume is around -2 dB

How Loud Is Too Loud?

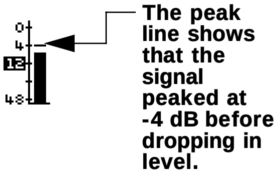
In general, you want each signal to be as loud as possible without exceeding 0 dB. 0 dB is the loudest a digital signal can get without causing clipping—see Page 58.

Each signal should be in the -12 dB to 0 dB range when you're setting:

- a signal's input level
- Aux bus levels
- Direct path levels
- a track's recording level
- the overall level of a mix
- output levels

When you're mixing, the playback level of individual tracks is determined by how they sound in the mix, not by metered levels. Fortunately, if you've set each track's recording level properly, it'll be impossible to set its playback level so that it exceeds 0 dB.

To help you keep track of how loud your signals get, a peak line representing each signal's loudest level remains for a few moments in its meter after the signal's level goes back down. This lets you look from meter to meter without worrying that you've missed a too-loud signal peak.



The peak line shows that the signal peaked at -4 dB before dropping in level.

You can set the peak lines so they "stick" at their loudest levels until you release them, to make sure you don't miss anything important—see "PEAK HOLD Sw" on Page 358.

Pre- and Post-Fader Level Metering

You can meter the level of most any signal:

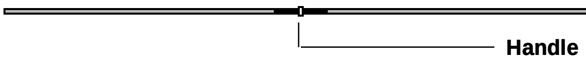
- when it's traveled through its entire channel except its final fader level control. This is called "pre-fader," or "pre" for short.
- after its level has been adjusted by its fader. This is called "post-fader," or "post."

You can't meter input signals pre- or post-fader because they haven't yet traveled through an input channel. You *can* meter an input channel's signal this way, however.

The meters display's pre/post indicator shows you whether you're viewing pre-fader or post-fader signals, as shown in the illustration on Page 116. The meter switches (Page 120) include a switch that lets you select a pre- or post-fader view.

In general, you'll want to view signal levels post-fader. However, it can be helpful to view pre-fader levels when you're experiencing a problem and need to track down the precise spot in the signal's signal flow at which the problem is occurring.

Position Bar

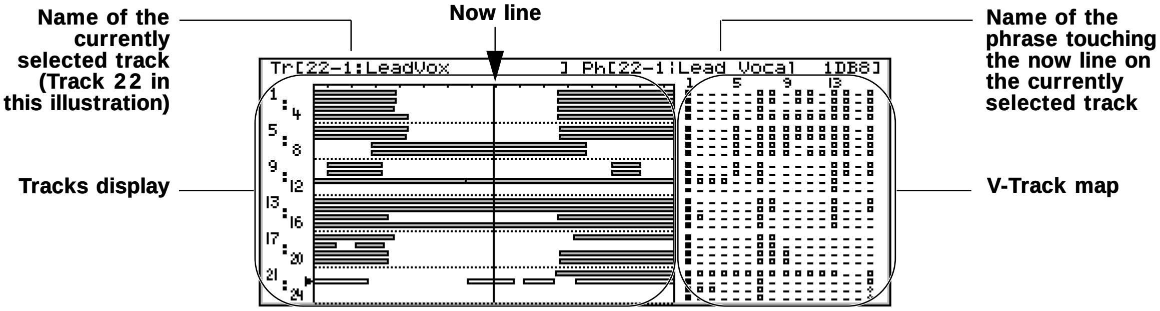


The position bar has a handle you can grab with your mouse and drag:

- rightward to move to a later time in the project.
- leftward to move to an earlier time.

The position bar's handle shows where you are in the project.The black area to either side of the handle shows the portion of the project currently displayed in the playlist.

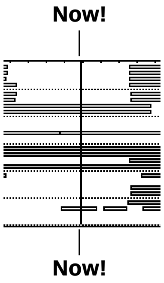
The Playlist


Name of the currently selected track (Track 22 in this illustration)
Now line
Name of the phrase touching the now line on the currently selected track
Tracks display
V-Track map
Tr[22-1:LeadVox] Ph[22-1:Lead Vocal 1DB8]

The project playlist shows you what's on a project's tracks, and is therefore central to all track editing operations. It shows you a left-to-right list of all of the phrases to be played back in a project. As a project plays, the displayed phrases move from right to left, with each phrase playing as it crosses the now line.

The name of the currently selected track is shown above the tracks display, and the name of the phrase on the track that's touching the now line is shown next to it.

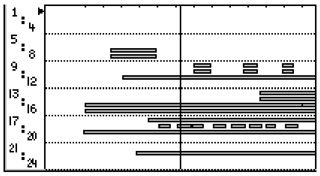
Now line



The now line shows your current position in a project. It's a graphic representation of the time shown in the current time location display (Page 122).The now line shows what part of the project is playing *now*. Some people call the now line the "now line."

The now line also plays a part in track phrase editing (Chapter 19). When a phrase is touching the now line, it can be selected for editing.

Tracks Display



When you zoom out, some track numbers are shown as dots in order to fit them all on the display.

The tracks display shows two things:

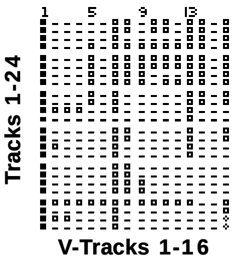
- the tracks in the current project
- the phrases on the tracks

Each track in the tracks display is a list of the phrases presented from left to right in the order in which they'll play.

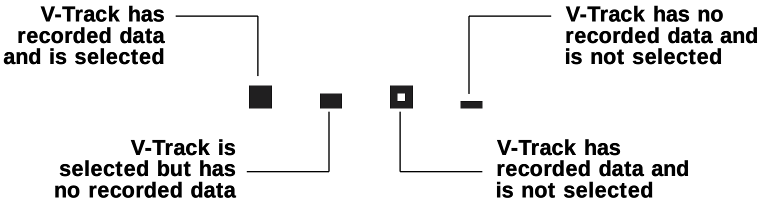
If this sounds similar to a V-Track (Page 85), you're right. Each track in the tracks display shows the string of phrases that comprise its currently selected V-Track. In fact, to put it more plainly: What you see on each track in the tracks display is its currently selected V-Track, laid out from left to right.

You can zoom in and out on the tracks display, and even expand its overall size. See "Zooming In and Out on the Playlist" and "Expanded Playlist Views" below.

V-Track Map


1
5
9
13
Tracks 1-24
V-Tracks 1-16

The V-Track map shows you the project's V-Tracks (Page 85) arranged in a grid of horizontal rows corresponding to the project's tracks. Each of the 16 V-Tracks in a row is represented by a symbol that tells you if the V-Track contains data and if it's currently selected or not.


V-Track has recorded data and is selected
V-Track has no recorded data and is not selected
V-Track is selected but has no recorded data
V-Track has recorded data and is not selected

During track editing, the V-Track map shows the V-Tracks involved in the current editing operation—see Page 247.

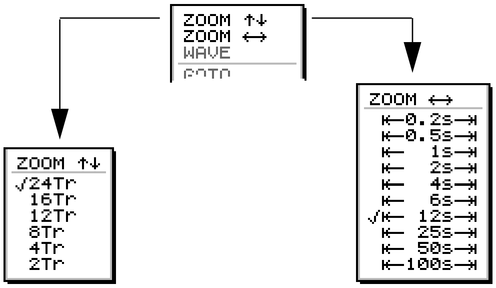
You can select a V-Track for recording and/or playback by clicking it with your mouse—a dialog appears to confirm that you've selected a new V-Track. You can also select a new V-Track for a track using its CH EDIT V.Trk parameter (Page 147).

Zooming In and Out on the Playlist

You can hold down SHIFT and press ◀ , ▶, ▲ or ▼ to change the magnification of the playlist's tracks. Press:

- *SHIFT* + ◀ —to squeeze the tracks so that more project time fits into view.
- *SHIFT* + ▶—to spread out the tracks so that you can see track data more clearly.
- *SHIFT* + ▲—to make the tracks taller, with fewer tracks fitting on the display.
- *SHIFT* + ▼—to fit more tracks onto the display.

You can also right-click on the playlist to open the Edit Pop-Up menu, which provides a pair of zooming options. Scroll to the type of zooming you want to set and click.


ZOOM ↑↓
ZOOM ↔
WAVE
ZOOM ↑↓
√24Tr
16Tr
12Tr
8Tr
4Tr
2Tr
ZOOM ↔
⇤0.2s⇥
⇤0.5s⇥
⇤ 1s⇥
⇤ 2s⇥
⇤ 4s⇥
⇤ 6s⇥
√⇤ 12s⇥
⇤ 25s⇥
⇤ 50s⇥
⇤100s⇥

Choose the number of tracks to be displayed

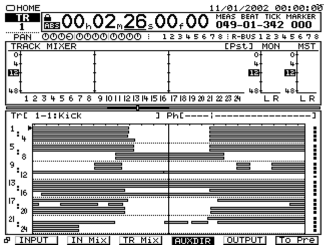
Choose the desired power of horizontal magnification

In either dialog, you can select the desired magnification by scrolling to it and clicking.

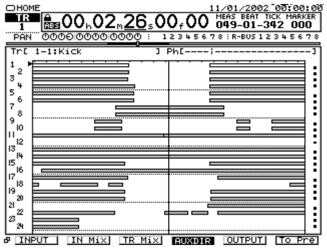
Expanded Playlist Views

You can hold down SHIFT and press HOME•DISPLAY to more radically change the way the playlist is displayed. Each time you press HOME•DISPLAY, the screen cycles through two additional playlist views and back to its original appearance:

Wide


HOME
11/01/2002 00:00:00
00h02m26s00f00
049-01-342 000
TRACK MIXER
[Pst] MON MST
Tr[1-1:Kick
INPUT
IN Mix
TR Mix
AUXDIR
OUTPUT
To Pre

Wide and tall


HOME
11/01/2002 00:00:00
00h02m26s00f00
049-01-342 000
Tr[1-1:Kick
INPUT
IN Mix
TR Mix
AUXDIR
OUTPUT
To Pre

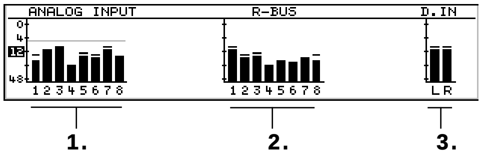
- *Wide view*—the tracks fill the entire width of the Home screen.
- *Wide and tall view*—the tracks expand in height as well, reaching up to the position bar. The meters or fader/pan display and V-Track map are hidden.

You can further zoom in and out in the wide and wide and tall playlist views using the techniques described in “Zooming In and Out on the Playlist” on Page 119.

Meter Switches

The meter switches determine the signals to be shown in the meters display. Select:

- *F1 (INPUT)*—to show the level of signals coming into the input jacks from the analog and digital input jacks and connectors.

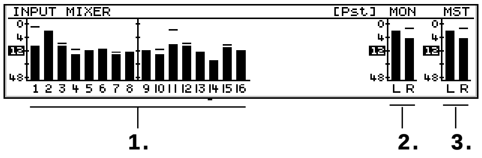

ANALOG INPUT
R-BUS
D.IN
0
4
12
48
1 2 3 4 5 6 7 8
1 2 3 4 5 6 7 8
L R
1.
2.
3.

1. **Analog Inputs 1-8**
2. **R-BUS Digital Inputs 1-8**
3. **Coaxial or Optical Digital Inputs 1 and 2**

The light gray line across the analog input meters shows the current setting of the input peak indicators (Page 122).

An input jack’s signal can be metered only once it’s been routed to an input channel.

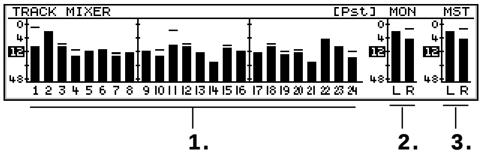
- *F2 (IN Mix)*—to show the level of input channel signals before or after their faders, and to show the MONITOR and MASTER bus levels.


INPUT MIXER
[Pst] MON
MST
0
4
12
48
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
L R
L R
1.
2.
3.

1. **Input Channels 1-16**
2. **Stereo MONITOR bus**
3. **Stereo MASTER bus**

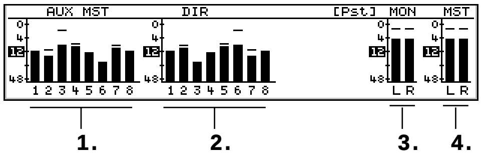
When you’re recording a track, the level setting of the input channel that’s routed to the track sets the track’s recording level.

- *F3 (TR Mix)*—to show the playback levels of the tracks and the MONITOR and MASTER bus levels.


TRACK MIXER
[Pst]
MON
MST
0
4
12
48
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
L R
L R
1.
2.
3.

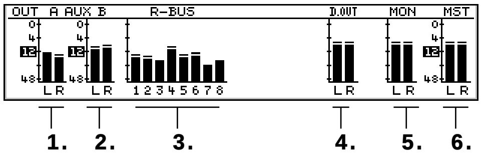
1. **Track Channels 1-24**
2. **Stereo MONITOR bus**
3. **Stereo MASTER bus**

- *F4 (AUXDIR)*—to show the master levels of the eight Aux send busses, eight Direct paths and the MONITOR and MASTER bus levels.


AUX MST
DIR
[Pst]
MON
MST
0
4
12
48
1 2 3 4 5 6 7 8
1 2 3 4 5 6 7 8
L R
L R
1.
2.
3.
4.

1. **Aux Busses 1-8**
2. **Direct Paths 1-8**
3. **Stereo MONITOR bus**
4. **Stereo MASTER bus**

- *F5 (OUTPUT)*—to show the levels of signals at the VS-2400CD analog and digital output jacks and connectors.


OUT
A AUX B
R-BUS
D.OUT
MON
MST
0
4
12
48
L R
L R
1 2 3 4 5 6 7 8
L R
L R
L R
1.
2.
3.
4.
5.
6.

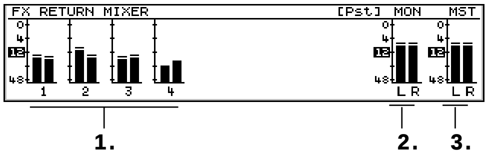
1. **Stereo Aux Output A**
2. **Stereo Aux Output B**
3. **R-BUS Digital Outputs 1-8**
4. **Stereo Coaxial or Optical Digital Outputs**
5. **Stereo MONITOR bus**
6. **Stereo MASTER bus**

- *F6 (To Pre/To Pst)*—This switch allows you to select pre or post metering (Page 117) when viewing the IN Mix, TR Mix and AUXDIR meter views. (The switch is grayed-out when you've selected the INPUT or OUTPUT meter views.) When the pre/post indicator (Page 116) shows "Pre," you can press F6 (To Pst) to set the metering to post-fader. When the indicator shows "Pst," you can press F6 (To Pre) to switch to pre-fader metering.

Pre- and post-fader AUXDIR metering shows Aux and direct bus signals before or after the Aux bus and Direct path master level controls—see Page 201 and Page 203.

The FX Return Channel Meters

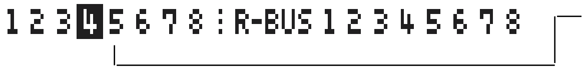
You can meter the levels of the four stereo FX return channels by pressing PAGE until "FX RTN" appears above F5. Press F5 (FX RTN) to display the FX return channel meters.


FX RETURN MIXER
[Pst]
MON
MST
0
4
12
48
1
2
3
4
L R
L R
1.
2.
3.

1. **FX Return Channels 1-4**
2. **Stereo MONITOR bus**
3. **Stereo MASTER bus**

Input Peak Indicators

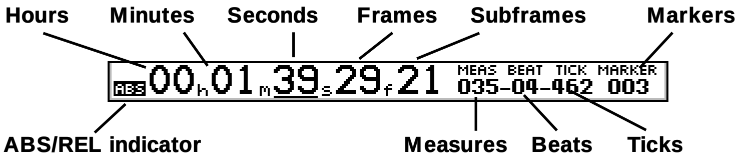
The input peak indicators help you set the level of signals coming into the VS-2400CD's analog input jacks. The 16 numbered indicators correspond to the 8 analog input jacks and eight digital R-BUS input connections, respectively.



In this illustration, Input Channel 4's signal is too loud.

When you're adjusting a SENS knob (Page 34) to set the input level for a signal coming into an analog input jack, a dark box appears around its input peak indicator if the signal exceeds a pre-determined level—the INPUT PEAK LEVEL parameter (Page 354) sets the input peak indicators to light when a signal reaches -6 dB, -3 dB or 0 dB. A light gray line appears in the INPUT meters display view (Page 120) to show the input peak indicators' current volume threshold setting.

Current Time Location Display



At the top of many of the VS-2400CD's screens is the current time location display, which consists of three project time counters. Each shows you the now line's current location in the project using its own form of time measurement:

This counter:	*Shows the current time:*
Time code	as hours, minutes, seconds, frames and subframes
Measures and beats	as measures, beats and ticks (there are 480 ticks in each beat)
Markers	by showing the last marker that passed across the now line

If you're recording MIDI instruments from a sequencer synced to the VS-2400CD, the measures and beats counter can make it easy to perform very precise track edits on the VS-2400CD. Be sure to set the project's time signature and tempo to match that of the sequencer before recording. See "Working with a Tempo Map" on Page 298.

Frame, subframe, tick

The ABS/REL indicator tells you whether the displayed time is:

- *absolute time (ABS)*—based on the real project start time.
- *relative time (REL)*—shifted during synchronization of the VS-2400CD to an external device. See "Shifting the Project Start Time" on Page 303.

Changing Your Current Location in a Project

You can change your location using the current time location display, moving through the project by any of its time increments.

To use the:	*Do this:*
mouse	1. Click on the desired unit of time measurement and drag up or down to move forward or back in the project.
Time/Value dial	1. Use ◀, or ▶ to underline the desired unit of time measurement. 2. Turn the Time/Value dial clockwise or counter-clockwise to move forward or back in the project. Hold SHIFT as you turn the dial to move by larger chunks of time.

You can move through a project by 1/100ths of a frame by selecting the time code counter's subframe value and holding down SHIFT as you turn the Time/Value dial.

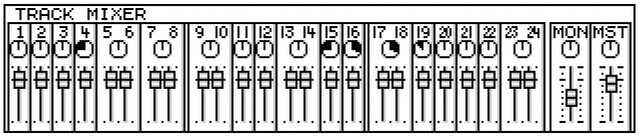
Clock, Calendar

The clock shows the current time and the calendar shows today's date.

In order for the calendar and clock to accurately show the current date and time, you must set the VS-2400CD's system clock. See Page 65.

You can replace the calendar and clock with a readout that shows you how much free space remains on the selected drive. See "DATE/REMAIN Sw" on Page 357.

Using the Fader/Pan Display



You can replace the meters display (Page 116) on the Home screen with the fader/pan display if you wish. The fader/pan display presents a small channel strip representing each channel of the type selected with the F/P Switches. Each onscreen channel strip contains a fader and pan knob that you can set using your mouse.

The F/P Switches

The F/P switches activate the fader/pan display and select the set of channels you'd like to view. To display the F/P switches, press PAGE until "IN F/P" appears above F2.

Press:	*To show channel strips for:*
IN F/P	the 16 input channels, the MONITOR bus and the MASTER bus.
TR F/P	the 24 track channels, the MONITOR bus and the MASTER bus.
AUXF/P	the eight Aux busses, eight Direct paths, four FX return channels, the MONITOR bus and the MASTER bus.

F5 (FX RTN) shows the meters for the four FX return channels, as described on Page 121.

About The ID Buttons

When you've pressed PAGE until ID PL, ID IN, ID TR, ID Mlt and ID ChV appear above the F buttons, you can use the buttons to select what's shown on the Info Display, as described in Page 382.

9—Working with Input Signals

This chapter describes how to get signals into the VS-2400CD's analog and digital input jacks and connectors. We'll discuss setting analog input levels and configuring the VS-2400CD's coaxial and optical digital inputs. Finally, we'll describe how to get your input signals to the desired input channels.

Analog Input Signals

Making Analog Connections

Before connecting instruments, microphones or other external sound sources to the VS-2400CD's analog input jacks, bring the MASTER fader all the way down to prevent damage to your speakers, headphones or other equipment as you make the connection. After the connection's been made, bring the MASTER fader back to its 0 marking.

When connecting an instrument, mic or other sound-producing device to the VS-2400CD, connect one end of the device's cable into the device, and the plug on its other end into the appropriate VS-2400CD jack.

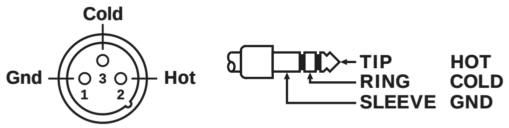
If you're using an AKG C3000B, Roland DR-20, Shure SM-57 or SM-10, or Lavaliere mic, consider using the VS-2400CD's Microphone Modeling to simulate the sound of an expensive studio mic—see Page 220.

The VS-2400CD's SENS knobs allow it to accommodate a wide range of input levels, from mic level (-50 dBu) to line level +14 dBu).

If a cable's plug doesn't exactly fit the input jack, *don't force it*. Make sure you've selected the correct VS-2400CD jack. If the jack seems too small or large, it's most likely the wrong jack. See Chapter 2 for detailed information on the VS-2400CD's input jacks. You may need to purchase an adaptor to use the cable with the VS-2400CD. If you're sure you've properly matched plug to jack and still have a problem with the connection, consult the vendor from whom you purchased the plug or cable.

About XLR Connectors

Each XLR plug and cable you use with the VS-2400CD must be wired as shown here.



Avoiding Feedback

If you're listening to the VS-2400CD through speakers, and you're using microphones, feedback—unpleasant high-pitched squealing—can occur. To avoid feedback:

- make sure that your mics are pointed away from the speakers to avoid feedback.
- try to move the mics and speakers further apart.
- turn down the speakers' volume.

To prevent hazard or damage, ensure that only microphone cables and microphones conforming to IEC-268-15A are connected.

Afin d'éviter tout risque ou dommage, ne brancher que des câbles de microphone et des microphones conformes à la norme IEC-268-15A.

French language
for Canadian Safety Standard

Phantom Power

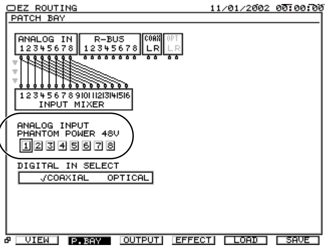
Each of the VS-2400CD's eight XLR jacks can supply +48 V phantom power to a connected condenser microphone that doesn't have its own internal power source.

Always turn the phantom power off when connecting any device other than condenser microphones that require phantom power. You risk causing damage if you mistakenly supply phantom power to dynamic microphones, audio playback devices, or other devices that don't require such power. Be sure to check the specifications of any microphone you intend to use by referring to the manual that came with it. (This instrument's phantom power: 48 V DC, 10 mA Max)

To Turn an XLR Input Jack's Phantom Power On or Off

If you've already routed the input jack to an input channel, bring the input channel's fader all the way down before turning the jack's phantom power on or off.

1. Hold down SHIFT and press EZ ROUTING•PHANTOM—the PATCH BAY screen appears.


EZ ROUTING
11/01/2002 00:00:00
PATCH BAY
ANALOG IN 12345678
R-BUS 12345678
COAX LR
OPT LR
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
INPUT MIXER
ANALOG INPUT
PHANTOM POWER 48V
1 2 3 4 5 6 7 8
DIGITAL IN SELECT
√COAXIAL OPTICAL
VIEW
P.BAY
OUTPUT
EFFECT
LOAD
SAVE

Phantom power switches

You can also turn phantom power on or off for each XLR input jack using the corresponding PHANTOM SW parameter on the UTILITY SYSTEM Param1 screen.

2. Press ◀ or ▶ to select the desired input jack if it isn't already selected.
3. Turn the Time/Value dial to turn the jack's phantom power on or off, as desired.

Read the manual for your microphone, and turn on phantom power only if you're using a condenser microphone that requires it. Phantom power can damage other mics.

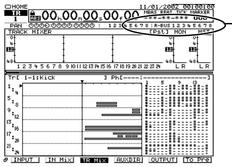
To avoid damage to a connected mic or instrument, make sure the corresponding XLR jack's phantom power is turned off when you're using one of the 1/4"TRS jacks.

Setting Analog Input Levels

Once you've connected a signal to an analog input jack, you'll need to set its level.

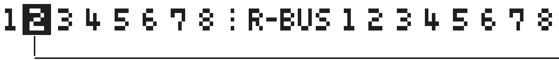
To Set an Analog Input Level

1. If you're connecting an electric guitar or bass to the GUITAR HI-Z jack, be sure to lock in the GUITAR HI-Z ON switch (Page 34).
2. Press HOME•DISPLAY on the VS-2400CD.
3. Send some signal into the input jack.
   The eight input peak indicators (Page 122)—the first 1-8 set of numbers in the top right part of the screen—represent the eight analog input jacks.


HOME
00.00.00.00.00
PAN
TRACK MIXER
INPUT
IN Mix
TR Mix
AUX&DIR
OUTPUT
To Pfd

Input peak indicators

4. Turn up the jack's SENS knob until its peak indicator lights on the display.


1 2 3 4 5 6 7 8 : R-BUS 1 2 3 4 5 6 7 8

In this illustration, Input Jack 2's input peak indicator has lit.

5. Turn the SENS knob counter-clockwise slightly until the indicator doesn't flash.

You can view a jack's level in the Home screen's INPUT meter view only if it's been routed to an input channel. If you don't see the jack's signal, see Page 130.

You can set the level at which the input peak indicators turn on (Page 354).

Digital Input Signals

Digital Connections

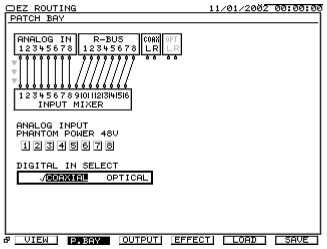
The VS-2400CD can accept digital audio from an external digital device through the VS-2400CD’s coaxial or optical digital inputs and via its R-BUS connector. To learn about connecting devices to these jacks, see Page 50.

Turning On the Coaxial or Optical Digital Inputs

The VS-2400CD can receive digital audio signals either through its coaxial or optical digital connectors, though not both at the same time. (The eight digital audio inputs provided by the R-BUS jack are always available.) .

Selecting the Coaxial or Optical Digital Inputs

1. Hold down SHIFT and press EZ•ROUTING—the PATCH BAY screen appears.
2. Press ▼ until DIGITAL IN SELECT is highlighted, as shown here.


EZ ROUTING
11/01/2002 00:00:00
PATCH BAY
ANALOG IN
12345678
R-BUS
12345678
COAX
LR
OPT
LR
12345678910111213141516
INPUT MIXER
ANALOG INPUT
PHANTOM POWER 48V
1 2 3 4 5 6 7 8
DIGITAL IN SELECT
√COAXIAL
OPTICAL
VIEW
P.BAY
OUTPUT
EFFECT
LOAD
SAVE

This illustration shows the PATCH BAY screen as it appears after a new project is created and with its first page displayed.

3. Turn the Time/Value dial to check:
    - *COAXIAL*—to turn on the stereo coaxial digital input.
    - *OPTICAL*—to turn on the stereo optical digital input.
4. Route the selected active inputs to the desired input channels as described on Page 130.

The DIGITAL IN SELECT parameter can also be found on the UTILITY menu’s PROJECT PARAMETER screen.

Digital Considerations

This section discusses a couple of issues you should consider to help ensure that your digital audio is successfully captured by the VS-2400CD.

Sample Rates

The VS-2400CD operates at the sampling rate of the currently loaded project. As a result, it will successfully receive only external digital audio that uses that sample rate.

Sample rate

If you’re creating a new project, set it to the sample rate of the external digital audio you want to bring in. Be aware, however, that the project will always remain at that sample rate—you can’t change it once the project’s been created.

If your source material is at a higher sample rate than your project, consider converting the external audio's sample rate to the project's sample rate before bringing it into the VS-2400CD. There are various devices and utilities that you can use for this purpose.

Bit Depth

The VS-2400CD records audio using 24 bits or 16 bits, according to the project's recording mode (Page 93). The M24 and MTP recording modes use 24-bit resolution; the other modes use 16-bit resolution.

If an external digital audio device uses a bit depth that's higher than your project's, dither the device's output down to the project's recording resolution before bringing the audio into the VS-2400CD. If the device uses the same or a lower bit depth, the VS-2400CD will record the audio as is, at the project's selected bit depth.

The VS-2400CD can also dither its digital output to match a lower bit depth used by an external digital device receiving audio from the VS-2400CD—see Page 357.

The Master Clock

In order for two digital audio devices to communicate successfully, they have to both use the same timing reference, or "master clock." If they don't, the digital audio they exchange is likely to wind up at the wrong pitch, or to have clicks and pops within it. The master clock timing reference can be produced by the device producing the digital audio. The timing information, called "word clock," is sent alongside the digital audio signal from the source device—the "master"—to the receiving device, called the "slave."

Who Should Supply the Master Clock?

There are two basic conditions in which you'll be bringing digital audio signals into the VS-2400CD's digital inputs, and each has its own master clock considerations:

- when its hard disk recorder *isn't* being synchronized to an external device
- when its hard disk recorder *is* being synchronized to an external device

When the VS-2400CD's hard disk recorder isn't being synchronized to an external device, and is receiving digital audio from a single external device, use the external device as the source of the master clock.

When the VS-2400CD's transport is being synchronized to an external device, and is receiving digital audio from the same device to which the VS-2400CD is being synchronized, use the device to which the VS-2400CD is being synchronized and from which the digital audio is coming as the master clock source. Set MASTER CLOCK to EXT TIME CODE.

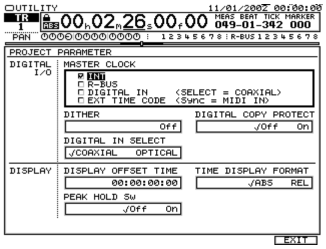
Each Roland R-BUS device has its own unique capabilities and setup parameters. The "Supplemental Information" chapter at the end of this manual explains how to set up each R-BUS device for use with the VS-2400CD—these instructions include details on configuring the devices for the successful transfer of digital audio into the VS-2400CD.

Designating the Master Clock for Digital Audio Input

When you're receiving digital input signals from a connected R-BUS device, either device can serve as the master—be sure to set up the other as a slave.

However, in order for the VS-2400CD to successfully receive digital audio from other external digital audio devices, the VS-2400CD should usually be slaved to an external master clock. Here's how to set up a successful master/slave digital audio relationship:

1. Hold down SHIFT and press F4•UTILITY.
2. Press PAGE until "Proj" appears above F3.
3. Press F3 (Proj) to view the DIGITAL I/O parameters.



UTILITY 11/01/2002 00:00:00
TR 1 ABS 00h02m26s00f00 MEAS BEAT TICK MARKER 049-01-342 000
PAN 1 2 3 4 5 6 7 8 R-BUS 1 2 3 4 5 6 7 8

PROJECT PARAMETER

DIGITAL I/O
MASTER CLOCK
☑ INT
☐ R-BUS
☐ DIGITAL IN <SELECT = COAXIAL>
☐ EXT TIME CODE <Sync = MIDI IN>
DITHER: Off
DIGITAL COPY PROTECT: √Off On
DIGITAL IN SELECT: √COAXIAL OPTICAL

DISPLAY
DISPLAY OFFSET TIME: 00:00:00:00
TIME DISPLAY FORMAT: √ABS REL
PEAK HOLD Sw: √Off On

4. Press ▲, if necessary, to select the MASTER CLOCK parameter.
5. Turn the Time/Value dial to select the desired master word clock source.

When you select:	*The master clock comes from:*
INT	the VS-2400CD.
R-BUS	the device connected to the VS-2400CD's R-BUS connector.
DIGITAL IN	the device connected to the activated COAXIAL or OPTICAL IN jack (Page 127). The currently active connector is shown to the right of "DIGITAL IN."
EXT TIME CODE	the device connected to the appropriate jack for the time code selected as the external sync source on the UTILITY menu's SYNC PARAMETER screen (Page 296).

Completing the Master/Slave Setup

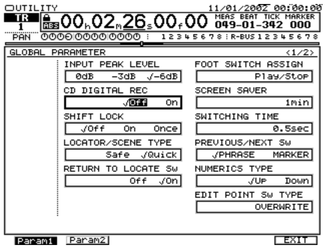
Make sure that the device designated as the master clock source uses its internal clock as its timing reference. On the VS-2400CD, set MASTER CLOCK to INT in Step 5 on Page 129.

To learn how to configure each external digital device, consult its documentation.

Recording Digital Input Signals

Before you can record signals received by the VS-2400CD's coaxial or optical digital IN jacks, you have to enable digital recording on the VS-2400CD. Here's how:

1. Hold down SHIFT and press F4•UTILITY.
2. Press PAGE until "GLOBAL" appears above F2.
3. Press F2 (GLOBAL).



GLOBAL PARAMETER <1/2>
INPUT PEAK LEVEL: 0dB -3dB √-6dB
CD DIGITAL REC: √Off On
SHIFT LOCK: √Off On Once
LOCATOR/SCENE TYPE: Safe √Quick
RETURN TO LOCATE Sw: Off √On
FOOT SWITCH ASSIGN: Play/Stop
SCREEN SAVER: 1min
SWITCHING TIME: 0.5sec
PREVIOUS/NEXT Sw: √PHRASE MARKER
NUMERICS TYPE: √UP Down
EDIT POINT Sw TYPE: OVERWRITE

If you don't see the screen shown here, press F1 (Param1).

4. Press ◂ , ▸ , ▴ and/or ▾ to highlight the CD DIGITAL REC parameter if necessary.
5. Turn the Time/Value dial to select On.
   The "Concerning Copyright" statement appears as a reminder of the laws governing the digital copying of copyrighted materials. It also presents Roland's position on the SCMS digital recording copy-protection protocol.
6. After reading the statement, press ENTER/YES, or press EXIT/NO to suspend activation of digital recording.
   If you pressed ENTER/YES in Step 6, the VS-2400CD licensing agreement appears.
7. If you agree to the displayed terms, press ENTER/YES. If not, press EXIT/NO to leave digital recording disabled.

Since the CD DIGITAL REC parameter is a global parameter, it doesn't ever need to be re-set unless you initialize your VS-2400CD's system settings (Page 368).

Routing Input Signals to Input Channels

Much of the internal "wiring" through which a signal travels from one place to another in the VS-2400CD is virtual—the signal path is determined by your current settings, not by permanently placed physical wires. This means that you can route signals from your eight analog input jacks—and your R-BUS or activated coaxial/optical digital input connector (Page 127)—to the input channels you want. This can save you lots of time un-plugging and re-plugging cables—this virtual patching system lets you send a signal where you need it to go without changing a single physical wire.

Patching

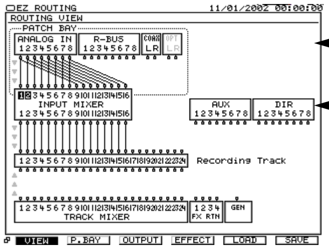
Once a signal has been routed to an input channel, you can shape the signal, add effects to it, and send it to the desired track or tracks for recording. If you wish, you can send it back out of the VS-2400CD to some external device. See Chapter 10 for general information on using mixer channels. Chapter 11 describes the various channel parameters and Chapter 12 provides detailed information about using input channels.

To clear all current input-to-input channel routings, press PAGE until "ClrPB" appears above F2, and then press F2 (ClrPB). To initialize them to their default routings—with the eight inputs connected to both Input Channels 1-8, respectively, but also to Input Channels 9-16—press F1 (IniPB).

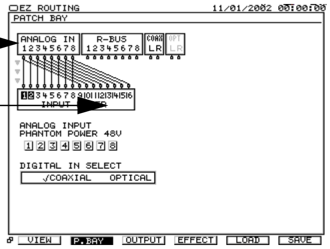
Choosing an Input Patching Screen

You can route inputs to input channels on either of two screens:

ROUTING VIEW screen


EZ ROUTING
11/01/2002 00:00:00
ROUTING VIEW
PATCH BAY
ANALOG IN
R-BUS
COAX
OPT
INPUT MIXER
AUX
DIR
Recording Track
TRACK MIXER
FX RTN
GEN
VIEW
P.BAY
OUTPUT
EFFECT
LOAD
SAVE

PATCH BAY screen


EZ ROUTING
11/01/2002 00:00:00
PATCH BAY
ANALOG IN
R-BUS
COAX
OPT
INPUT
ANALOG INPUT
PHANTOM POWER 48V
DIGITAL IN SELECT
√COAXIAL
OPTICAL
VIEW
P.BAY
OUTPUT
EFFECT
LOAD
SAVE

This row of boxes shows all of your analog and digital input jacks and connectors.

This box shows the 16 input channels.

The lines between the inputs and input channels are "wires" that represent connections. The light-gray arrows at the left of each screen shows the direction in which its wires' signals are flowing.

The above illustrations show the screens as they appear in a newly created project.

Both screens have two pages—see Chapter 22, either of which can be used for routing. The only difference between the pages are their F button options.

To get to the:	*Fast method:*	*Alternate method:*
PATCH BAY screen	1. Hold SHIFT and press EZ ROUTING	1. Press EZ ROUTING or F7 on your keyboard. 2. Press F2 (P.BAY) or F2 on your keyboard
ROUTING VIEW screen	1. Press F7 on your keyboard	1. Press EZ ROUTING. 2. Press F1 (VIEW) if necessary

How Input Connections Work

Input Channel Perspective

Input routing is done from the input channels' point of view. You begin by selecting the desired input channels, and then choose the signals you want to route to them.

Two by Two

In the VS-2400CD's virtual patching system, all input jacks, digital input connectors and input channels are grouped into odd/even pairs:

- When you select input channels, you select an odd/even pair of input channels.
- When you choose the signals you want to route into those input channels, you select an odd/even pair of inputs jacks or connectors.

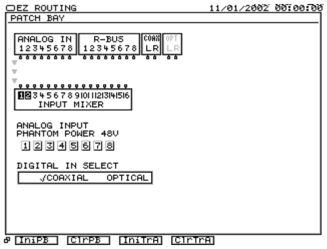
Though the input and input channel pairs are pre-set and can't be changed for patching, each input channel otherwise operates independently unless you've linked it to another input channel (Page 147). You can send any input channel signal to any track.

Patching Input Connections

We'll use the PATCH BAY screen here for simplicity—you can also perform these steps on the ROUTING VIEW screen, or use the CH EDIT P.BAY screen (Page 160).

Connecting Input Signals to Input Channels

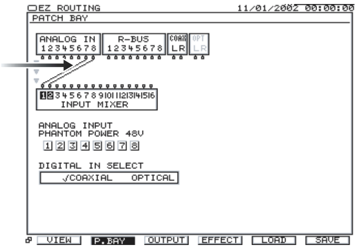
1. Go to the PATCH BAY or ROUTING VIEW screen (Page 130), and use ◀, ▶, ▲ and/or ▼ to highlight the input channels to which you want to route your input signals.


EZ ROUTING
11/01/2002 00:00:00
PATCH BAY
ANALOG IN
12345678
R-BUS
12345678
COAX
LR
OPT
LR
12345678910111213141516
INPUT MIXER
ANALOG INPUT
PHANTOM POWER 48V
1 2 3 4 5 6 7 8
DIGITAL IN SELECT
√COAXIAL
OPTICAL
IniPB
ClrPB
IniTrA
ClrTrA

We've selected Input Channels 1 and 2.

(In this illustration, we've cleared all input-to-input channel connections for visual clarity.)

2. Turn the Time/Value dial clockwise. With each tick of the dial, the next pair of inputs—viewed from left to right—is routed to the selected input channels.


EZ ROUTING
11/01/2002 00:00:00
PATCH BAY
ANALOG IN
12345678
R-BUS
12345678
COAX
LR
OPT
LR
12345678910111213141516
INPUT MIXER
ANALOG INPUT
PHANTOM POWER 48V
1 2 3 4 5 6 7 8
DIGITAL IN SELECT
√COAXIAL
OPTICAL
VIEW
P.BAY
OUTPUT
EFFECT
LOAD
SAVE

Before an R-BUS 2, coaxial or optical digital connector can be routed to input channels, it must be activated—see Page 127.

3. Turn the Time/Value dial to route the desired pair of inputs to the input channels.

You can route the same inputs to multiple pairs of input channels—this allows you to create two different versions of a signal that you can use for different purposes.

4. To break the connection between an input pair and its input channels, turn the Time/Value dial clockwise until no wires connect them.

10—Using the Digital Mixer

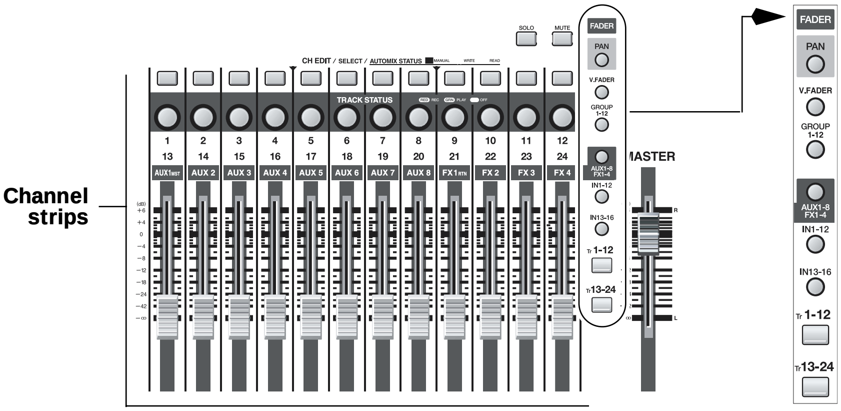
In this chapter, we'll discuss how to perform basic operations on the mixer. For an introduction to the VS-2400CD's built-in digital mixer, see Chapter 3.

Changing Channels

As described on Page 52, all of the VS-2400CD's 52 mixer channels are active and available at all times.

- 16 input channels
- 8 Aux master channels
- 24 track channels
- 4 FX return channels

In the white FADER section to the left of the red MASTER fader, you'll find a set of buttons that control what the channel strips to the left do. When you press a FADER button, the 12 physical strips become the controls you've selected.


Channel strips
SOLO
MUTE
CH EDIT / SELECT / AUTOMIX STATUS
MANUAL
WRITE
READ
TRACK STATUS
REC
PLAY
OFF
1 2 3 4 5 6 7 8 9 10 11 12
13 14 15 16 17 18 19 20 21 22 23 24
AUX1 AUX 2 AUX 3 AUX 4 AUX 5 AUX 6 AUX 7 AUX 8 FX 1 FX 2 FX 3 FX 4
MASTER
FADER
PAN
V.FADER
GROUP 1-12
AUX1-8 FX1-4
IN1-12
IN13-16
Tr 1-12
Tr 13-24

The channel strips can do a few other things as well. They can:

- control the levels of the 12 available fader groups.
- adjust the stereo panning for the currently selected set of input, track or FX return channels.
- set the Aux send levels from the currently selected set of channels.
- adjust a parameter of your choosing in the currently selected set of channels.
- act as a MIDI control surface for an external MIDI device (Page 286).

You can assign the channel strips to any of these jobs by pressing the appropriate FADER button. We'll discuss each of these roles in this chapter, with the exception of the last one, which is described in Chapter 23.

If you ever get confused about what the channel strips are controlling, just look at the four FADER buttons—they'll tell you at a glance what the channel strips are doing.

Switching Between Input, Track, Aux and FX Channels

You can turn the 12 physical channel strips into the channel controls you want with a single button-press.

Press...	*Channel Strips 1-12 control:*	*Press...*	*...and Channel Strips 1-12 control:*
IN1-12 ○	Input Channels 1-12	IN13-16 ○	Input Channels 13-16
Tr 1-12 ☐	Track Channels 1-12	Tr 13-24 ☐	Track Channels 13-24

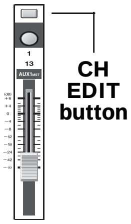
Press...	*and Channel Strips 1-8 control:*	*while Channel Strips 9-12 control:*
○ AUX1-8 FX1-4	Aux Masters Channels 1-8	FX Return Channels 1-4

Channel Selection

When you want to adjust a channel's parameters, you must first select the channel.

Selecting a Channel for Editing

Using the CH EDIT Buttons



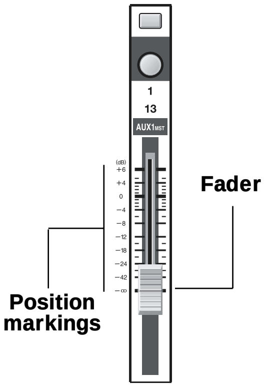
1. Press the FADER button that selects the set of channels containing the channel you want to work with (Page 133).
2. Press the desired input, track or FX return channel's CH EDIT button. The CH EDIT button lights and the channel's parameters appear onscreen.

An Aux master channel has no CH EDIT parameters to adjust. You can configure an Aux bus as described on Page 201.

You can also use your mouse to select any channel from the Channel Pop-Up menu, described on Page 69.

About the Channel Faders

Each channel strip provides a fader whose primary job is the control of the channel's signal level—you can also use the faders for controlling other things, as we've already noted. Faders are especially helpful when adjusting, or "riding," signal levels during an actual recording or mix. (You set up basic recording levels using the SENS knobs, as described on Page 126.)



The VS-2400CD's faders are motorized, so each fader automatically moves to its channel's current level setting when you press one of the FADER buttons to select a new set of channels. When you use Automix (Chapter 25), the faders move up and down automatically to reflect automated level changes. And when you load a project, the faders move to their channels' most recent level settings.

The faders have markings printed to their left that show the relative position of each fader in dBs—you can see these in the illustration on the previous page. To the left of the channel strips area, numbers are printed alongside these markings.

When a fader is at its 0dB position, it's neither adding to or subtracting from the level of its input signal or recorded track. This position is referred to as "unity gain," since the signal's level leaving the fader is the same as it is coming into the fader.

Controlling Fader Group Levels with the Channel Strips

You can simultaneously control the levels of a group of input, track or FX return channels by moving a single fader. The channels retain their level settings relative to each other, but can be made louder or softer as a group. This can be handy when, for example, you want to raise or lower the level of a set of drum tracks in a mix, or background vocals, and so on. To simultaneously control the levels of a group of channels, assign each one to one of the 12 available fader groups using the channel's CH EDIT GROUP parameter, described on Page 150. You can control each group by moving the fader of any of its channels.

If you'd like to control several groups' levels at the same time, press the GROUP 1-12 FADER button to assign the 12 channel strip faders to the control the levels of Fader Groups 1-12, respectively.

Setting a Fader to Unity Gain and Centering its Panning

The VS-2400CD provides a quick shortcut for setting a channel's fader to its unity gain position. This procedure also places the channel's signal to the center stereo position.

After adjusting an input's SENS knob when setting input levels, set its input channel's fader to its unity gain position.

To Reset a Channel's Fader and Pan

1. Press the desired FADER button.
2. While holding down CLEAR, press the desired channel's CH EDIT button.

Adjusting Stereo Positioning Using Faders

You can set the stereo positioning—or "panning"—of the 12 currently selected input, track or FX return channels in the MASTER mix or when you're bouncing using your 12 faders. This lets you quickly set up the panning for all of your channels without having to individually navigate to each channel's pan setting.

As you move a fader to set a channel's panning, the PAN knob on the Home screen turns to reflect the changes you make.

Activating Knob Control of Channel Panning

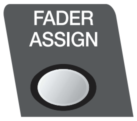
1. Select the desired group of channels. If you want to adjust the stereo position of:
   - *Input Channels 1-12*—press IN 1-12.
   - *Input Channels 13-16*—press IN 13-16.
   - *Track Channels 1-12*—press Tr 1-12.
   - *Track Channels 13-24*—press Tr 13-24.
   - *FX Return Channels 1-4*—press AUX 1-8/FX 1-4.

- Press the PAN FADER button so it lights. To turn off fader-controlled panning, press the button again so its light goes out.

Since the fader groups and V.FADERs don't require panning, the PAN FADER button only lights if you've selected input, track or FX return channels.

Since this feature provides a fast way to get to the pan setting for multiple channels at once, bear in mind that you may be adjusting the panning of a channel whose parameters aren't currently in view on the display.

The FADER ASSIGN Button



The FADER ASSIGN button—located above the VS-2400CD's numeric keypad—allows you to set the channel faders so that you can use them to:

- send any input, track or FX return channel's signal to one of the Aux busses.
- adjust the value of a selected input, track or FX return channel parameter in any channel.

You can use the FADER ASSIGN feature when you want to quickly adjust the selected Aux send or desired channel parameter for multiple input, track or FX return channels.

To Turn the FADER ASSIGN Feature On and Off

1. Press FADER ASSIGN so that it's flashing to turn the feature on. The flashing provides a visual cue that you've assigned the faders to a special task.
2. Press FADER ASSIGN again—so its indicator light goes out—to turn the feature off.

Activating Fader Control of Aux Send Levels

Before you can control a channel's Aux send level with its fader, make sure you've turned on the channel's CH EDIT Send Status parameter. For input and track channels, see Page 148. For FX return channels, see Page 226.

1. Select the desired group of input, track or FX return channels by pressing the corresponding FADER button (Page 134).
2. Press FADER ASSIGN above the keypad so that its indicator flashes.
3. On the keypad, press the number of the Aux bus whose send levels you'd like to control (1-8). The selected Aux bus's number lights on the keypad.
4. Move a channel fader to adjust the corresponding channel's send to the selected Aux bus.

Controlling a Parameter of Your Choice

The VS-2400CD allows you to assign any CH EDIT parameter to the channel faders so you can quickly adjust its value for all of your channels. This parameter is referred to as the "USER" parameter, and can be handy in any number of situations. For example:

- In a recording session in which you're recording multiple players at once, select ATT as your USER parameter so that you can move from input to input, adjusting each input's level attenuation by moving its fader.
- The fact that you can select any channel parameter as your USER parameter lets you use the channel faders as convenient realtime controllers when you're recording Automix data (Chapter 25).

Setting the USER Parameter

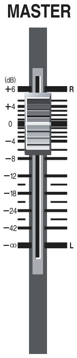
1. Hold down SHIFT and press F4•UTILITY to display the UTILITY menu.
2. Press PAGE—if necessary—until "V.FDR" appears above F6.
3. Press F6 (V.FDR).
4. Press F3 (Param3)—the USER FADER ASSIGN to parameter appears.
5. Turn the Time/Value dial to select the parameter to which you want to assign fader control.

Activating Fader Control of Any Channel Parameter

1. Select the desired group of input, track or FX return channels by pressing the corresponding FADER button (Page 134).
2. Press FADER ASSIGN above the keypad so the button flashes.
3. On the numeric keypad, press 9•USER. Its indicator button lights, and the channel faders are now controlling the selected USER parameter.

Your USER parameter choice is stored with each project, so that whenever you're working on a project, you can quickly switch the faders back to the control of your USER parameter.

The MASTER Fader



The MASTER fader—located at the far right of the channel strip area—controls the overall level of the main stereo MASTER mix.

While Recording

During recording, you'll typically listen to this mix, so moving the MASTER fader affects how loud the overall mix is. It's a good idea to set it to 0db in this context, and then use the MONITOR or PHONES knobs to actually set the listening level.

When you're recording, the setting of the MASTER fader has no effect on the level of signal recorded on your tracks—it adjusts the level of the mix you're listening to.

While Mixing

Since the MASTER fader controls the level of the MASTER mix, its setting is critical in controlling the overall level of your final mix. When you fade out your mix, you'll use the MASTER fader to perform the fadeout.

Automix can memorize a fadeout you perform using the MASTER fader.

The VS-2400CD's level meters tell you how loud or soft your overall mix level is. To learn about metering in the VS-2400CD, see "Meters Display" on Page 116.

Start your mix by setting the MASTER fader to 0db, and adjust your channels' levels to achieve the proper overall level. Once you're close to finishing your mix, you can move the MASTER fader to fine-tune the overall level.

Muting and Soloing Channel Signals

There may be times when you'd like to temporarily silence, or "mute," individual channels in order to hear your other signals more clearly. Likewise, you may want to isolate, or "solo," individual channels so that you can listen to them without hearing other channels' signals. While you can always turn track channels on or off by pressing their TRACK STATUS buttons, the VS-2400CD provides two ways for you to more easily mute and un-mute or solo and un-solo input, track and FX return channels:

- You can turn on a channel's CH EDIT MUTE or SOLO switch (Chapter 11).
- To quickly control the muting or soloing of multiple channels, you can use Mute mode and Solo mode, respectively.

In both Mute and Solo modes, the CH EDIT/SELECT/AUTOMIX STATUS buttons are referred to as simply the "SELECT" buttons since they select the channels that are muted or soloed.

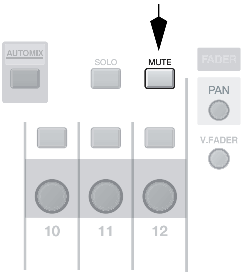
If a channel is both muted and soloed at the same time, the channel's signal is muted.

Mute Mode

Mute mode lets you mute or un-mute multiple input, track and FX return channels quickly and easily. After muting the desired channels, you can leave Mute mode with the channels remaining muted. You can return to Mute mode at any time to un-mute the silenced channels, or you can turn off their CH EDIT MUTE switches.

Automix can record and play back the muting and un-muting of channels.

Muting Channels in Mute Mode



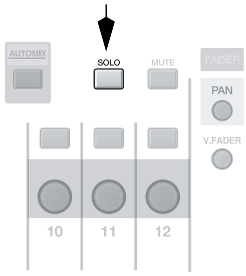
1. Press MUTE, located at the right above the channel strips. The channel strips' SELECT buttons flash. When a channel strip's SELECT button is flashing in Mute mode, its signal is not muted.
2. Press the desired FADER button to select the set of channels containing the channel you wish to mute.
3. Press the desired channel's SELECT button—it lights solidly to show the channel is muted, and its signal silenced. You can mute as many channels as you wish.
4. To un-mute a channel, press its SELECT button again. It flashes to show that the channel's no longer muted.
5. To exit Mute mode, press MUTE again.

To un-mute all currently muted channels, hold down CLEAR and press MUTE.

Solo Mode

In Solo mode, you can quickly isolate individual channels—temporarily silencing all other channels—so that you can hear them more clearly. After you've soloed the desired channels, you can exit Solo mode and turn to other tasks with the selected channels remaining soloed. You can return to Solo mode at any time to un-solo the channels or turn off their CH EDIT SOLO switches.

Soloing Channels in Solo Mode



1. Press SOLO, located to the right above the channel strips. The channel strips' SELECT buttons flash. When a channel strip's SELECT button is flashing, its signal is not soloed.
2. Press the desired FADER button to select the set of channels containing the channel you wish to solo.
3. Press the desired channel's SELECT button—it lights solidly to show the channel is now soloed, and all other channels are temporarily silenced. You can solo as many channels as you like.
4. To un-solo a channel, press its SELECT button again. It flashes to show that the channel's no longer soloed.
5. To exit Solo mode, hold down SOLO again.

To un-solo all currently soloed channels, hold down CLEAR and press SOLO.

Scenes

The VS-2400CD allows you to save a wide range of current mixer settings as a "scene." Each project can contain up to 100 scenes. A scene contains all of your current:

- channel fader positions
- MASTER level settings
- channel parameter settings
- signal routings
- effect settings

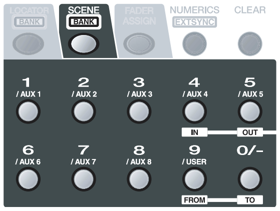
When you save your settings as a scene, you "store" the scene. When you re-install its settings, you "recall" the scene. You can recall a scene at any time a project isn't playing. You can name each scene to help you remember what it contains, and protect individual channels from having their settings changed when a scene is recalled.

Scenes don't store your listening levels. Before recalling a scene, make sure that your MONITOR and PHONES knobs are set to levels that won't result in any nasty surprises. Use these knobs to adjust your listening level after recalling the scene.

Since so much time in any studio is spent setting up and adjusting your settings, scenes are incredibly convenient, allowing you to try out and save alternate versions of a setup or mix. In addition, since a scene includes the V. Track CH EDIT parameter that determines the audio each track is to play, you can actually create and store different versions of a project, containing different elements—vocal and instrumental performances, different solos, and so on—that can be recalled instantly.

Scenes are stored in sets called "scene banks," with each bank containing ten scenes, numbered from 0 to 9. You can also name each scene to help you identify it.

Basic Scene Operations



You can quickly and easily store and recall scenes using the VS-2400CD's numeric keypad when its SCENE•BANK button is lit to show you're in Scene mode.

Scenes can be stored and recalled only when a project isn't currently playing.

You can also store and recall scenes from the UTILITY menu (Page 141).

You can use the Scene feature's Safe mode, and perform scene operations more carefully and slowly from a list in the SCENE window. See Page 141.

Storing a Scene

1. Press SCENE•BANK if it's not already lit.
   Each scene is stored in a numbered location from 0 to 9, corresponding to the 0-9 buttons on the numeric keypad. When a scene has been stored in a location, the corresponding number button is lit on the keypad.
2. Press any 0-9 button on the keypad to store the scene in the corresponding location. If you'd like to store the scene in a different scene bank, follow the instructions in "Changing Scene Banks" and press its button in the selected bank.
3. If a location already contains a scene, and you'd like to store a new scene in its place, you'll have to clear the older scene first. See "Clearing a Scene" on Page 140.

Recalling a Scene

1. Press SCENE•BANK if it's not already lit.
2. If the current scene bank contains the scene you want, press the scene's lit button on the keypad. To recall a scene from a different bank, follow the instructions in "Changing Scene Banks" and then press the scene's button in the desired bank.

Changing Scene Banks

1. Press SCENE•BANK if it's not already lit. If any scenes are stored in the currently selected scene bank, their buttons light on the numeric keypad.
2. While holding down SHIFT, press SCENE•BANK. The button for the currently selected bank lights solidly, and the other keypad buttons flash.
3. Press 0-9 to select the desired scene bank—if scenes are stored there, their numbers light on the keypad.

Clearing a Scene

1. Press SCENE•BANK if it's not already lit. If you'd like to clear a scene from a different bank, see the instructions in "Changing Scene Banks" before proceeding.
2. While holding down CLEAR, press the desired scene's button on the keypad. The scene is cleared from that location, and the button's light turns off.

Leaving Scene Mode

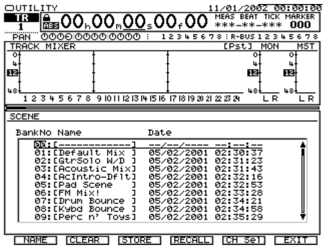
With its default settings, after you store or recall a scene, the VS-2400CD reverts to Locator mode and the numeric keypad goes back to its normal job of recalling locators (Page 179)—this is intended to help you get right back to navigating your way through the project. You can change this default behavior if you wish so that Scene mode remains active—and the SCENE button remains lit—until you manually leave it.

1. Hold down SHIFT and press F4•UTILITY.
2. If you don't see "GLOBAL" above F2, press PAGE until it you do.
3. Press F2 (GLOBAL).
4. If F1 (Param1) isn't highlighted, press F1 (Param1).
5. You can set the RETURN TO LOCATE Sw parameter to:
   - *On*—to automatically return to Locate mode after you store or recall a scene.
   - *Off*—so that you return to Locate mode by manually pressing LOCATE.
6. Press F6 (EXIT) to confirm your changes.

Editing Scenes

You can edit scenes on the UTILITY menu's SCENE screen. You can name them, clear them, store and recall them, and select the channels whose settings are to be recalled.

1. Hold down SHIFT and press F4•UTILITY.
2. Press PAGE repeatedly until "SCENE" appears above F1.
3. Press F1 (SCENE).


UTILITY
11/01/2002 00:00:00
TR
1
ABS
00h00m00s00f00
MEAS BEAT TICK MARKER
-**- 000
PAN
R-BUS
TRACK MIXER
[Pst] MON MST
L R
SCENE
NAME
CLEAR
STORE
RECALL
CH Sel
EXIT

```
BankNo Name             Date
 00:[------------]  --/--/---- --:--:--
 01:[Default Mix ]  05/02/2001 02:30:37
 02:[GtrSolo W/D ]  05/02/2001 02:31:23
 03:[Acoustic Mix]  05/02/2001 02:31:43
 04:[AcIntro-Dflt]  05/02/2001 02:32:16
 05:[Pad Scene   ]  05/02/2001 02:32:53
 06:[FM Mix!     ]  05/02/2001 02:33:28
 07:[Drum Bounce ]  05/02/2001 02:34:21
 08:[Kybd Bounce ]  05/02/2001 02:34:58
 09:[Perc n' Toys]  05/02/2001 02:35:29
```

The VS-2400CD time-stamps each scene when it's created, as shown on this screen.

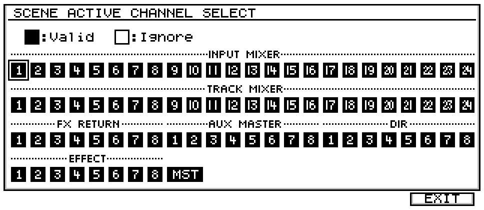
4. Press ▲ or ▼ or turn the Time/Value dial to select the desired scene. You can:
   - Press F1 (NAME) to rename (Page 71) the selected scene.
   - Press F2 (CLEAR) to delete the selected scene.
   - Press F3 (STORE) to store your current settings as the selected scene.

Save a new scene by selecting a blank location in the list and pressing F3 (STORE).

   - Press F4 (RECALL) to recall the selected scene.
   - Press F5 (Ch Sel) to protect channels when scenes are recalled—see below.
5. Press F6 (EXIT) when you're done to confirm your changes.

Protecting a Channel's Settings When a Scene is Recalled

1. Hold down SHIFT and press F4•UTILITY.
2. Press PAGE repeatedly until "SCENE" appears over F1.
3. Press F1 (SCENE).
4. Press F5 (CH Sel). The channel-selection box appears.


SCENE ACTIVE CHANNEL SELECT
■:Valid
☐:Ignore
INPUT MIXER
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
TRACK MIXER
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FX RETURN
1 2 3 4 5 6 7 8
AUX MASTER
1 2 3 4 5 6 7 8
DIR
1 2 3 4 5 6 7 8
EFFECT
1 2 3 4 5 6 7 8 MST
EXIT

Each channel is represented by a box. When the box is black, its settings will be changed when a scene is recalled. When it's white, they won't.

5. Press ◀, ▶, ▲ and/or ▼ to select a channel you want to protect. (In the above illustration, Input Channel 1 is selected, as shown by the outline around its box.)
6. Turn the Time/Value dial so the channel's box turns white to show it's protected.
7. Repeat Steps 5 and 6 for any channels you want to protect/ignore.
8. Press F6 (EXIT) when you're done.

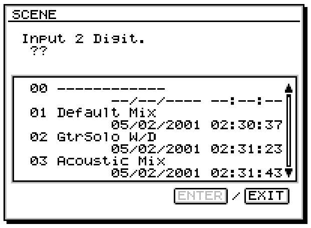
Scenes in Safe Mode

Scenes are so fast and easy to recall that it's possible to grab the wrong one, especially when recalling a scene by its number, not its name. Safe mode provides a SCENE window that shows each scene's number *and* name. You can also store and clear scenes in Safe mode. Though a slower way to work, it helps ensure you've got the right scene.

Turning on Scene Safe Mode

1. Hold down SHIFT and press F4•UTILITY.
2. If "GLOBAL" doesn't appear above F2, press PAGE until it does.
3. Press F2 (GLOBAL).
4. The UTILITY menu's LOCATOR/SCENE TYPE parameter turns Safe mode on or off—see Page 356. Its default value is Quick. To turn on Safe mode, select Safe.

Recalling a Scene in Safe Mode

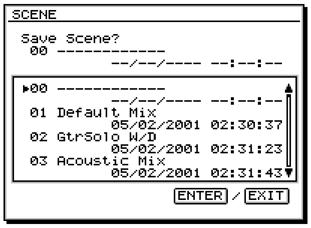


```
SCENE
 Input 2 Digit.
  ??

  00 ------------
              --/--/---- --:--:--
  01 Default Mix
              05/02/2001 02:30:37
  02 GtrSolo W/D
              05/02/2001 02:31:23
  03 Acoustic Mix
              05/02/2001 02:31:43
```

1. Press SCENE—the SCENE window opens.
2. Turn the Time/Value dial to scroll through the list until the desired scene is visible.
3. Enter the scene's two-digit number on the keypad—an arrow appears to the left of the scene in the list, and "Load Scene?" appears in the window.
4. Press ENTER/YES to recall the selected scene and close the window, or just press EXIT/NO twice to leave the window without recalling a scene.

Storing a Scene in Safe Mode

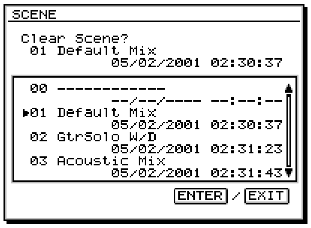


```
SCENE
 Save Scene?
  00 ------------
              --/--/---- --:--:--

 ▶00 ------------
              --/--/---- --:--:--
  01 Default Mix
              05/02/2001 02:30:37
  02 GtrSolo W/D
              05/02/2001 02:31:23
  03 Acoustic Mix
              05/02/2001 02:31:43
```

1. Press SCENE—the SCENE window appears.
2. Turn the Time/Value dial to scroll through the list until the desired unused scene memory location is visible.
3. Enter the memory location's two-digit number on the numeric keypad—an arrow appears to the left of the scene in the list and "Save Scene?" appears in the window.
4. Press ENTER/YES to store your current mixer settings in the selected scene memory location and close the window, or just press EXIT/NO twice to leave the window without saving the scene.

Clearing a Scene in Safe Mode



```
SCENE
 Clear Scene?
  01 Default Mix
              05/02/2001 02:30:37

  00 ------------
              --/--/---- --:--:--
 ▶01 Default Mix
              05/02/2001 02:30:37
  02 GtrSolo W/D
              05/02/2001 02:31:23
  03 Acoustic Mix
              05/02/2001 02:31:43
```

1. Press SCENE—the SCENE window appears.
2. Turn the Time/Value dial to scroll through the list until the desired scene is visible.
3. Enter the scene's two-digit number on the numeric keypad—an arrow appears to the left of the scene in the list.
4. Press CLEAR—"Clear Scene?" appears.
5. Press ENTER/YES to clear the selected scene and close the window, or just press EXIT/NO three times to leave the window without clearing the scene.

Resetting Mixer Parameters

You can quickly reset most mixer parameters to their default values should you wish to start over with a "clean slate." To do this:

1. Hold down SHIFT and press UTILITY.
2. Press PAGE until "PrmIni" appears above F6.
3. Press F6 (PrmIni).
4. Turn the Time/Value dial to select MIXER.
5. Press F5 (OK)—a confirmation screen appears.
6. If you're sure you want to proceed, press ENTER/YES. To cancel the operation, press EXIT/NO.

The reset procedure does not initialize all of the mixer's settings. For example, it doesn't delete your scenes, or reset the LOCATOR/SCENE TYPE parameter described on Page 141.

11—Input and Track Channel Tools

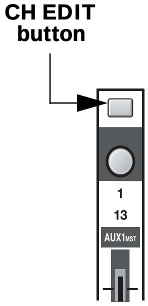
Input channel and track channels offer almost exactly the same parameters with which you can shape their signals. This chapter describes these "CH EDIT" parameters, named for the button you press to view them. They have their own chapter since they're the main tools you use to make your input signals and tracks sound the way you want.

Input channel CH EDIT settings affect how a signal will be recorded. Track channel CH EDIT changes affect only how the hard disk recorder plays a track, and are therefore less permanent. If you're not sure about a change you're thinking of making to a signal you're about to record, make the changes in its track channel.

Though this chapter discusses working with the CH EDIT parameters from the CH EDIT screens, you can also control any CH EDIT parameter using the faders' USER feature (Page 136) or on your VGA main display (Page 379).

FX return channels have their own CH EDIT parameters. However, they're a bit different than the CH EDIT parameters discussed here—you can learn about them in Chapter 17.

Viewing a CH EDIT Screen



To view the CH EDIT parameters for an input channel or track channel:

1. Press the desired FADER button (Page 133).
2. Press the desired channel's CH EDIT button.
3. To view a specific CH EDIT screen whose F button is currently:
   - *visible*—press the screen's F button.
   - *hidden*—press PAGE, and then press the screen's F button.

Introduction to the CH EDIT Screens

There are six CH EDIT parameter screens for input channels and track channels.

Input channel CH EDIT screens:		*Track channel CH EDIT screens:*	
VIEW	P.BAY	VIEW	ASSIGN
DYN	EQ	DYN	EQ
FX Ins	Surrnd	FX Ins	Surrnd

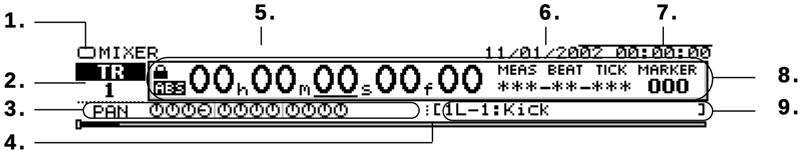
The two sets of screens are identical except for the input channels' P.BAY screen and the track channels' ASSIGN screen.

How the CH EDIT Screens Are Organized

All of the CH EDIT screens have three sections. The top and bottom sections are always available as you move from CH EDIT screen to CH EDIT screen. When you select a new CH EDIT screen, it's the contents of the middle area that change. This chapter devotes a section to each CH EDIT screen, or—more precisely—what you'll find in the middle section of each screen.

The Top of the CH EDIT Screens

The top of each CH EDIT screen contains elements also found on the Home screen:


1.
5.
6.
7.
MIXER
11/01/2002 00:00:00
TR
1
ABS
00h00m00s00f00
MEAS BEAT TICK MARKER
-**- 000
PAN
L-1:Kick
2.
3.
4.
8.
9.

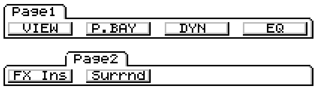
This illustration shows the top section of an input channel. In a track channel, the input peak indicators are replaced by the selected track's name.

1. **Display Pop-Up Menu button**
2. **Current channel display**
3. **PAN knob display**
4. **Position bar**
5. **View label**
6. **Clock**
7. **Calendar**
8. **Current time location display**
9. **Input peak indicators**

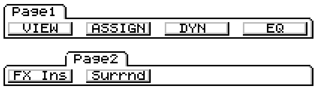
For a detailed description of what's at the top of a CH EDIT screen, see Chapter 8.

The Bottom of the CH EDIT Screens

At the bottom of the CH EDIT screens you'll find an F button for each CH EDIT screen. The buttons are organized into a pair of tabbed layers. Press the PAGE button to toggle between the two layers.


Page1
VIEW
P.BAY
DYN
EQ
Page2
FX Ins
Surrnd

The input channel tabs

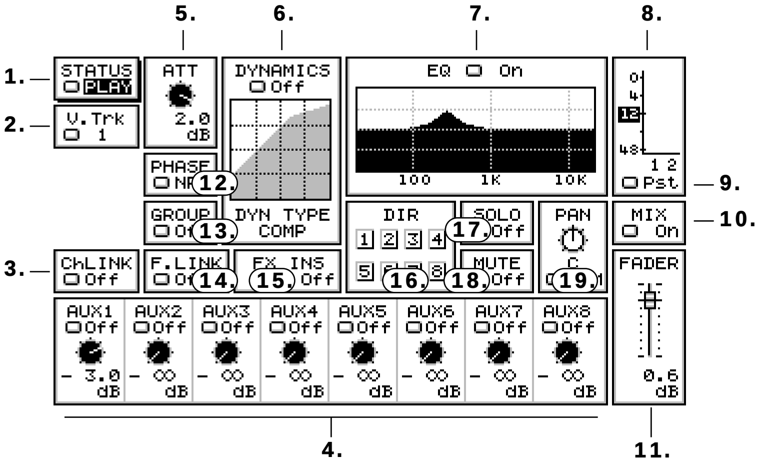

Page1
VIEW
ASSIGN
DYN
EQ
Page2
FX Ins
Surrnd

The track channel tabs

The remaining F buttons activate CH EDIT tools available on various CH EDIT screens. We'll describe the role of F5 on the VIEW, DYN and EQ screens in the following sections. F6 turns on the parameter view, described on Page 161.

The CH EDIT Screens

The CH EDIT VIEW Screen


5.
6.
7.
8.
1.
2.
3.
STATUS
PLAY
V.Trk
1
ATT
2.0
dB
DYNAMICS
Off
PHASE
NR
12.
GROUP
13.
DYN TYPE
COMP
EQ
On
100
1K
10K
0
4
12
48
1 2
Pst
9.
DIR
1 2 3 4
5 8
17.
SOLO
Off
PAN
C
MIX
On
10.
ChLINK
Off
F.LINK
14.
FX INS
15.
Off
16.
18.
MUTE
Off
19.
FADER
0.6
dB
AUX1
AUX2
AUX3
AUX4
AUX5
AUX6
AUX7
AUX8
Off
- 3.0
- ∞
dB
4.
11.

This illustration shows a track channel CH EDIT VIEW screen. 1 and 2 are present only in track channels—with input channels, that area of the screen is empty.

To learn about the CH EDIT VIEW screen's CpyPRM button, see Page 163.

You can toggle back and forth between the CH EDIT VIEW screen and the last non-CH EDIT screen you were on by repeatedly pressing CH EDIT.

You can hold down SHIFT as you turn the Time/Value dial to move through parameter values in fine increments on the CH EDIT VIEW screen.

1. STATUS (track channel only)

STATUS
PLAY

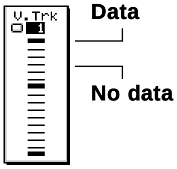
The STATUS parameter mirrors the behavior of the TRACK STATUS buttons (Page 172). Changing a track's recording or playback status in either place changes it in both. You can set the parameter to:

- *PLAY*—The track channel's TRACK STATUS button lights green and any data that's been recorded on the track plays back when you press the PLAY transport button (Page 171).
- *REC*—The TRACK STATUS button flashes red to show that the track is now armed for recording. To learn how record, see "Recording a New Track" on Page 173.
- *MUTE*—The TRACK STATUS light turns off and the track is silenced.

2. V.Trk (track channel only)

The V.Trk selector allows you to select one of the track's 16 V-Tracks for recording and/or playback. To learn about V-Tracks, see Page 85.

You can use this parameter to select the desired V-Track in either of two ways. In both cases, you start by selecting the V.Trk parameter. Then, you can:



- turn the Time/Value dial to select the desired V-Track.
- press the flashing ENTER/YES button to view the V. Trk Pop-Up window that graphically displays all 16 of the track's V-Tracks. Each V-Track appears as a line. If the line is thin, there's no recorded data on the V-Track—if it's thick, there is. Turn the Time/Value dial to select the desired V-Track and press ENTER/YES to complete the process and close the window.

You can also select a track channel's V-Track with your mouse using the Home screen's V-Track map. See Page 119.

3. ChLink

When CHLink ("Channel Link") is turned on, the current channel becomes linked to the channel next to it. If the current channel is:

- *odd-numbered*—it's linked to the even-numbered channel to its right.
- *even-numbered*—it's linked to the odd-numbered channel to its left.

When channels are linked, you can change a CH EDIT parameter's value in both channels at once by changing it in either of the linked channels. This can be especially helpful when two channels control the left and right sides of a stereo signal.

When you link input or track channels, each resulting pair of inputs or tracks acts as a single stereo object during routing, with a single input and output connection point.

You can quickly link channels by pressing the even-numbered channel's CH EDIT button while holding down the CH EDIT button for its odd-numbered partner.

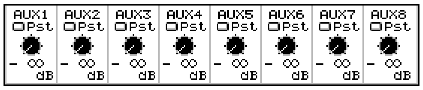
When two channels are linked, their PAN and FADER parameters change in appearance and behave differently. See Page 152 and Page 150, respectively, for more.

When you link two channels, the VS-2400CD moves their faders to 0dB or to their most recent linked level value. When you unlink channels, both are reset to 0dB.

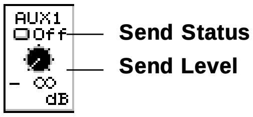
When channels are linked, you can individually adjust their FADER and PAN settings on the PRM.V—"parameter view"—screen (Page 161). You can press ENTER/YES when FADER's selected to jump to its parameter view.

The F.LINK parameter (Page 151) links only the channels' faders if you want to retain individual control of their other parameters.

4. AUX Send Controls 1-8

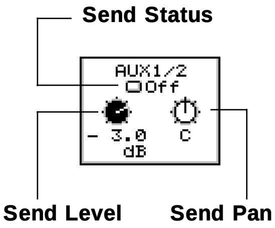


The AUX Send Controls 1-8 allow you to send a copy of the channel's signal to an Aux bus routed to an internal effect or output jack or connector. There's a separate pair of controls for sending the channel's signal to each of the eight Aux busses. (To learn more about the Aux sends, see Chapter 15.)



- *The Send Status parameter*—turns the channel's send to the Aux bus on or off. Select:
  - *Off*—so that no signal is sent to the Aux bus from the channel.
  - *Pre or Pst (depending on the Aux bus's current configuration)*—to turn on the send to the Aux bus from the channel. See below for more details.
- The Send Level parameter sets the amount of the channel's signal to be sent to the Aux bus. The range is from -∞ to 6 dB.

  If the Aux bus is configured as one of a linked pair of Aux busses, its Send Level control changes in appearance and behavior. It sets the amount of the channel's signal to be sent to both linked busses. The Send Pan knob that appears controls the signal's position in the stereo image created by the two linked Aux busses.



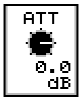
About Aux Send Configuration

In the VS-2400CD, each Aux bus can accept pre-fader signals from all input and track channels *or* post-fader signals from the input and track channels—not a mix of both. An Aux bus can also be linked with its odd/even partner to form a single stereo send. You can configure an Aux bus on the MASTER EDIT VIEW screen (Page 201) or from the CH EDIT VIEW screen as described on Page 201.

To learn about pre- and post-fader Aux sends, see "Pre-Fader and Post-Fader Sends" on Page 81. For more about linking Aux busses, see "Stereo Aux Busses" on Page 200.

You can also send channel signals to an Aux bus using the faders—see "Activating Fader Control of Aux Send Levels" on Page 136.

5. ATT



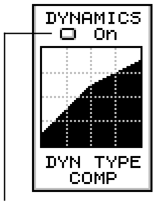
The ATT ("Attenuation") parameter allows you to adjust the level of the signal coming into the channel. If the signal is clipping or sounds distorted, you can lower the ATT value by as much as -42.0 dB. If the signal is too soft, you can raise it by up to 6.0 dB.

The ATT parameter can be particularly handy when you're working with a digital input signal, since its input level is set by the device producing it. You can adjust its input channel's ATT value to place the signal at a proper level (Page 58).

When you're working with analog input signals, you won't usually need to change the ATT setting if you've properly set your input levels (Page 126). The same is true if you've recorded your tracks correctly, as described on Page 58. Even so, the ability to adjust the level of the signal coming into a channel can be handy if the need arises.

6. DYNAMICS

The DYNAMICS section provides an on/off switch that lets you turn the channel's dynamics tools on or off from the VIEW screen, and graphically shows you the current dynamics settings. The channel's dynamics parameters are found on its DYN screen (Page 152).



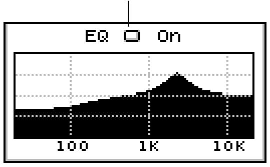
Dynamics on/off switch

When the DYNAMICS on/off switch is selected, press the flashing ENTER/YES button to jump directly to the DYN screen.

7. EQ

In the VIEW screen's EQ section, you can see the channel's current EQ settings presented in graphic form, and can turn all of the channel's EQ bands on or off with a single switch. Set the channel's EQ parameters on its EQ screen (Page 157).

EQ on/off switch

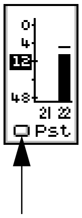


When the EQ on/off switch is selected, press the flashing ENTER/YES button to jump directly to the EQ screen.

8. Channel Output Meter

9. Channel Output Meter Pre/Post Switch

The channel output meter shows the level of the channel's signal as it leaves the channel. With an input channel, this is particularly important since it shows the level at which the signal is being sent to a track and recorded—in essence, it's the recording level (see Page 173). When you're creating a mix, the meter can help you visually keep track of a channel's level.



Pre/post switch

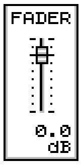
The channel output meter pre/post switch allows you to set the channel output meter so it shows the channel signal's pre-fader level or post-fader level—it can be set to Pre ("Pre-fader") or Pst ("Post-fader"). Most of the time, leave it to set to Pst to show the channel's final output level. The Pre setting is useful if you're using a pre-fader Aux (Page 148) or Direct path (Page 151) and want to view the level of the channel's signal before it's sent. Also, if you want to verify that a track has been successfully recorded, set its track channel meter to Pre—this lets you see the recorded signal level.

10. MIX

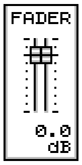
When MIX is turned on, the channel's signal is sent into the VS-2400CD's MASTER mix. When it's turned off, it's not. When you're mixing, each track channel's MIX parameter must be turned on to hear its signal in the mix.

As shipped from the factory, all of the VS-2400CD's input and track channels are sent into the MASTER mix. You may want to remove the input channels from the mix during recording so that you're not bothered by unwanted input channel signals as you play back your recorded tracks. See Page 169.

11. FADER



When you adjust the FADER parameter's value to raise or lower the output from the channel, you're doing the same thing as moving its physical fader—in fact, if the channel's level is currently being controlled by the channel strips, you'll see the fader move as you adjust the parameter.



When a channel is linked with its odd/even partner (Page 147, Page 151), the appearance of the FADER parameter changes to a stereo fader to show that adjusting the parameter's value changes the level for both linked channels.

You can see the channel's output level in the channel output meter (Page 149).

The FADER parameter provides a handy way to change a channel's output level when the 16 physical channel strips are controlling other channels.

If a channel is linked (Page 147), you can individually adjust its FADER value by pressing ENTER/YES when FADER is selected—a pop-up window with a common stereo fader and individual faders appears. Press ENTER/YES again when you're done setting FADER values in the pop-up window.

12. PHASE

Conflicting air-pressure changes produced by two sound waves can result in the two sounds canceling each other out momentarily—the sounds can disappear altogether. More typically, a "swirling" effect will be heard. This happens most frequently in situations with multiple mics placed close together, as when a drum kit is being recorded. To fix this, change the PHASE switch value from Nrm ("Normal") to Inv (for "Invert") to reverse the timing, or "phase," of one or more of the signals until their sound waves agree and the problem is resolved.

13. GROUP

The VS-2400CD provides 12 fader groups, each of which lets you to simultaneously control the level of a group of input, track and/or FX return channels while maintaining the volume differences between them. This can be extremely helpful if you're happy with the way a group of signals work together, but you need to make all of them louder or softer. Rather than having to individually adjust each channel's level, you can assign them to a fader group and move a single fader to raise or lower their levels as one unit, preserving the delicate balance you've established between them.

To Assign Channels to a Fader Group:

1. Set the individual channels' levels as desired.
2. Press CH EDIT for the first channel you want to add to the group and navigate to its CH EDIT VIEW screen if necessary.
3. Set GROUP to the number of the fader group you want to use, from 1 to 12.
4. Repeat Steps 2-4 for the other channels you want to include in the group, using the same number in Step 3 for each of the channels.

Once the channels have been grouped, you can move any of their faders to simultaneously raise or lower the levels of all of the group's channels. To remove a channel from a group, set its GROUP parameter to OFF.

You can control the level of the fader groups using the channel strip faders—see Page 135. If you've connected a VGA to your VS-2400CD, you can also assign channels to groups on the fader groups' multi-channel view page (Page 433).

You can change the level of a channel in a fader group without affecting the group's other channels by holding down CLEAR and moving its fader to the desired position. When you release the CLEAR button, the channel is returned to fader group control.

14. F.LINK

The F.LINK (for "Fader Link") on/off switch lets you link the faders of odd/even channel pairs. If the current channel is:

- *odd-numbered*—its fader is linked with that of the even-numbered channel to its right.
- *even-numbered*—its fader is linked with that of the odd-numbered channel to its left.

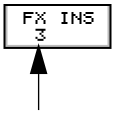
When two channels' faders are linked, you can move either fader to control the output level of both channels simultaneously. This can be handy when you want to simultaneously adjust the levels of two related channels.

When you link two channels' faders, the VS-2400CD sets them both to 0dB, or to their last linked setting. When you un-link the faders, the faders are reset to 0dB.

When two channels are linked, their FADER parameter changes in appearance and behaves differently. See Page 150.

The F.LINK parameter differs from the ChLink parameter in that it only links the channels' faders. All of their other parameters remain independent of each other.

15. FX INS



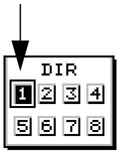
In this illustration, Effect 3 is inserted in the channel.

The FX INS display shows the number of any effect that's been inserted into the channel's signal flow(Page 80), or "Off" if there are no effects inserted in the channel.

Press ENTER/YES to jump to the FX Ins screen to insert an effect on the channel, or to remove an insert effect. See Page 211.

16. DIR 1-8

DIR Bus 1 is selected and highlighted here.



Use the DIR 1-8 boxes to assign the channel to any of the eight Direct paths (Page 202) pre- or post-fader (Page 203).

To assign a channel's signal to a Direct path from a CH EDIT VIEW screen:

1. Select the desired Direct path box.
2. Turn the Time/Value dial so that its number is highlighted.

Only one channel's signal can be routed to a Direct path at a time, it replacing the channel previously routed to the path. For a list of the channels currently routed to the Direct paths, press ENTER/YES. Press EXIT/NO to close the list.

17. SOLO

Turn SOLO on to quickly isolate the channel by turning off any other channels whose SOLO switch is not turned on. To solo multiple channels, you'll find it quicker to use Solo Mode (Page 138).

When a channel is soloed in Solo Mode, its SOLO switch is automatically turned on.

18. MUTE

Use a channel's MUTE switch to quickly silence the channel's signal. To quickly mute more than one channel, use Mute mode (Page 138).

When a channel is muted in Mute Mode, its MUTE switch is automatically turned on.

19. PAN

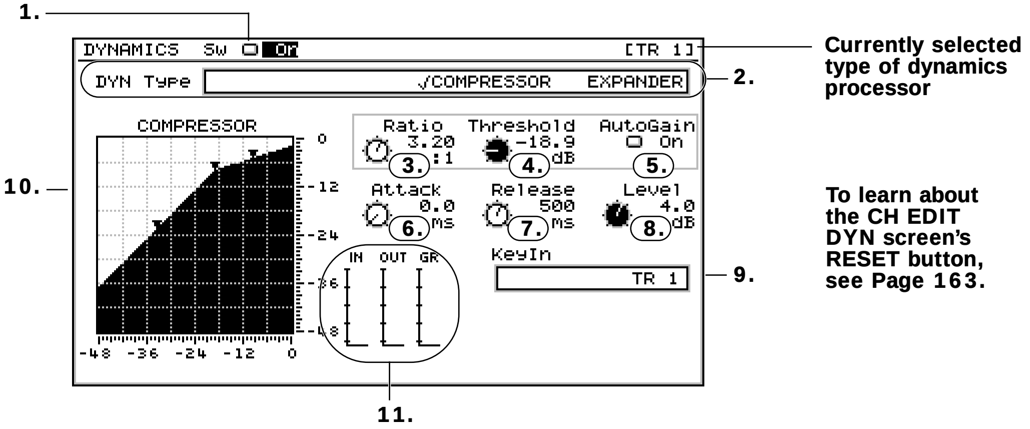
The PAN knob sets the channel's stereo position in the MASTER mix and when you're performing a stereo bounce (Page 189). PAN can be set from L63—all the way to the left—to R63—all the way to the right.

When the channel's parameters are linked with another channel via the ChLink parameter, the appearance of the PAN parameter changes to show the stereo image created by the two linked channels. Adjusting the PAN parameter's value shifts their entire stereo image left or right while maintaining the positions of the two channels relative to each other.

Use the PAN parameter only when the channel's signal is being sent to a stereo destination, such as the MASTER mix, a pair of tracks or a pair of outputs.

You can also use the faders to set a channel's PAN value. See "Adjusting Stereo Positioning Using Faders" on Page 135.

The DYN Screen


DYNAMICS SW ☐ On [TR 1]
DYN Type √COMPRESSOR EXPANDER
Ratio 3.20 :1
Threshold -18.9 dB
AutoGain ☐ On
Attack 0.0 ms
Release 500 ms
Level 4.0 dB
KeyIn TR 1

Currently selected type of dynamics processor

To learn about the CH EDIT DYN screen's RESET button, see Page 163.

Each VS-2400CD input and track channel has its own dynamics processor that can act as a compressor or expander for the channel's signal.

What is Dynamics Processing?

A dynamics processor—as its name suggests—shapes a signal by responding to changes in its level. It can help you control extreme fluctuations in volume or exaggerate them by reducing portions of the signal's level, or "gain."

The Basic Mechanics of Dynamics Processing

All dynamics processors respond to the same fundamental information:

- A threshold level setting tells the processor to start working when the channel's signal is at a particular level.
- An attack setting tells the processor how quickly it should respond when the signal hits the threshold level.
- A ratio setting tells the processor how much to change the signal's level.
- A release setting tells the processor when to stop changing the signal's level.

The VS-2400CD offers the following dynamics processors on the DYN screen.

What's a Compressor?

A compressor is a device that reduces the difference between the loudest part of a recording and the softest—what it compresses is the signal's dynamic range. This can smooth out volume peaks and can make the signal more manageable.

Compression can also add its own sound to a signal, making it seem tighter and more professional, since compressors are used so widely on commercial recordings.

When a signal's level exceeds the threshold setting, the compressor lowers the signal's gain—the ratio setting determines by just how much. The attack time sets how quickly the compressor starts reducing the signal's level after it crosses the threshold, and the release time determines how long the compressor keeps working before letting the signal return to its un-processed level.

What's an Expander?

The DYN screen expander is a downward-type expander that exaggerates the differences between a signal's loudest parts and its softest parts—it widens, or "expands," the signal's dynamic range. You can use an expander to make unwanted background noise quieter. An expander can also make a signal's original dynamic changes more exciting by making them more pronounced.

An expander can be handy when it's used as a gating mechanism that makes unwanted background noise quieter than it is in the original signal.

The expander works by bringing down the level of any signal that falls below the threshold level setting, making the signal even quieter. The ratio setting determines how much gain reduction will be applied. The speed at which expansion begins is set by the attack time, and the release time sets how long expansion lasts before the signal's allowed to rise back up to its un-processed level.

1. Dynamics Sw

DYNAMICS Sw ☐ On

The Dynamics switch—also visible on the CH EDIT VIEW screen—turns the channel's dynamics processor on or off.

2. DYN Type

DYN Type
√COMPRESSOR
EXPANDER

Select the desired type of dynamics processor by setting the DYN Type switch. Choose:

- COMPRESSOR
- EXPANDER

3. Ratio

The ratio setting determines the strength of the dynamics processing to be applied to signals as they cross the threshold level (Page 154).

For a:	*The Ratio parameter sets how much gain reduction will be applied when:*
compressor	the signal's level exceeds the threshold level setting.
expander	the signal's level falls below the threshold level setting.

You can set Ratio anywhere from 1.00:1 to ∞:1. The Ratio setting tells you how much a signal's level is to be changed by describing how much gain control the processor would apply to keep a signal 1 dB from the threshold. With a 4.00:1 compressor ratio, for example, every time a signal exceeds the threshold by 4 db, the compressor reduces the signal level so that it's only 1 dB above the threshold. An 8.00:1 compressor ratio therefore suggests—and requires—twice as much gain reduction to keep the signal down to the same 1 dB.

The logic of the Ratio setting can be simply stated as: The higher the number to the left of the colon, the more the dynamics processor reduces the level of the channel's signal as it moves beyond the threshold level setting.

When a compressor's ratio is set to a 10:1 value or higher, the compressor acts as a "limiter" because it effectively blocks signals from becoming too loud.

As you look for the right compression ratio, start out with a lower value and gradually increase the Ratio setting until you like what you hear. If the sound of the processor turning on and off is too obvious—this is called "pumping"—lower the Ratio setting.

4. Threshold

Threshold
-24.0
dB

The Threshold value sets the signal level at which the dynamics processor starts applying gain reduction to the signal. It can be set from -24 dB to 0 dB.

For a:	*The Threshold parameter determines the signal level:*
compressor	above which the compressor begins to apply gain reduction.
expander	below which the compressor begins to apply gain reduction.

The Threshold value in essence sets how much of the signal will be processed:

- *When you're using a compressor*—setting Threshold to lower values means that more of the signal will be above the threshold and qualify for gain reduction.
- *When you're using an expander*—setting Threshold to higher values means that more of the signal will be below the threshold and qualify for gain reduction.

Threshold and Ratio Settings for a Compressor

While all of the DYN screen parameters interact, Threshold and Ratio work together as arguably the two most fundamental parameters. Here are some guidelines for setting Threshold and Ratio when you're using a compressor:

- For a signal that has just a few level peaks you want to tame, try a 4:1 Ratio value with a high Threshold setting so that only the loudest levels are compressed.
- To compress a singer, start with a 2:1 ratio—and a low Threshold value—and gradually raise the Ratio value to taste.
- To smooth out a bass or tighten a snare, try a middle/low threshold and a 4:1 ratio.
- To add sustain to a lead guitar, try a ratio of 8:1 with a low threshold.

Once you're got Threshold and Ratio working as desired, use the other settings to fine-tune your dynamics processing.

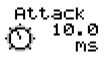
5. AutoGain

AutoGain
☐ On

AutoGain automatically boosts signals whose levels have been lowered by dynamics processing so that they peak at -6 dB below 0 dB.

AutoGain sets the signal to a maximum of -6 dB in order to leave a bit of headroom for fast transient volume peaks that occur before the dynamics processor has a chance to respond.

6. Attack


Attack
10.0
ms

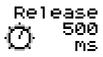
The Attack parameter—which can be set from 0.0 ms (milliseconds) to 800.0 ms—sets the speed at which gain reduction begins when a signal:

- goes above the threshold when you're using a compressor.
- falls below the threshold level when you're using an expander.

If you want to make sure your dynamics processor catches even the fastest peaks or drops in the signal, make the attack fast by setting Attack to a low value. If you're more concerned with applying gain reduction to signals that stay above or below the threshold for longer periods of time—with compression or expansion, respectively—set Attack to a higher, longer value.

Adjust the setting of the Attack parameter to help soften the audible pumping that can occur with a high Ratio value.

7. Release


Release
500
ms

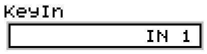
The Release parameter sets how long gain reduction will be applied, and can be set from 0 to 8000 ms. When your signal has a lot of quick changes in level, set Release to a high enough value that you don't hear the dynamics processor switching on and off constantly. If you're only interested in managing a few isolated level changes in a signal, try a shorter, lower value.

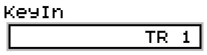
Adjust the setting of the Release parameter to help soften the audible pumping that can occur with a high Ratio value.

8. Level

Dynamics processing often affects the overall level of a signal. Use the Level parameter to re-adjust the signal's level as it leaves the dynamics processor.

9. KeyIn





The KeyIn parameter lets you select a different audio source as a trigger for your dynamics processor—the dynamics processor will respond to level changes in the KeyIn signal, and apply those changes to the current channel's signal.

- *For input channels*—you can select any input channel's signal.
- *For track channels*—you can select any track channel's signal.

To de-activate the KeyIn feature, set the KeyIn parameter to the current channel.

If the channel is linked, you can select a separate KeyIn signal for both linked channels.

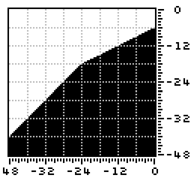
The KeyIn feature can be helpful when the current channel's signal level fluctuations aren't making the dynamics processor react the way you want. If there's another signal with stronger dynamic changes that match the timing of those in the channel's signal, you can use that other signal to drive the channel's dynamics processor.

If the signal you're working with is too steady in level to adequately trigger its dynamics processor, you can create a copy of the channel's signal to use just as a KeyIn signal source—don't send the copied signal to the main mix or a track. Add exaggerated EQ (Page 157) to the copy so that its level changes are more dramatic and can better trigger your dynamics processor. If you're working with an input channel signal, you can make your KeyIn copy by assigning the input jack or connector you're using to an additional input channel. If you're working with a track channel signal, you can record a dummy track with exaggerated EQ for KeyIn use.

You can use KeyIn to set up "ducking," in which one channel's signal level is automatically lowered in response to the presence of a signal in another channel. If you're doing spot production, for example, use your voice-over as the KeyIn source for your music bed—when the voice-over starts, the bed's level is automatically lowered.

You can also create interesting special effects by using a KeyIn signal whose dynamic changes don't match those in the channel's signal. This lets you impose a new, totally different set of dynamic changes on the channel's signal. For example, a KeyIn percussion sound can make the channel's signal level go up and down in rhythm.

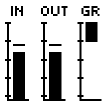
10. Graphic Dynamics Display



The graphic dynamics display shows you how the dynamics processor is shaping the level of the channel's signal. The numbers at the bottom of the graph represent the signal's original level, while the levels on the right show the action of the dynamics processor with your current settings.

Here's a simple way to understand the graphic display. Locate your Threshold setting along the lower edge of the display. If you're using a compressor, you can see how the compressor shapes your signal's level to the right of the threshold. An expander's effect is shown to the left of the threshold. With an expander/compressor, both sides of the threshold show the processor's effect.

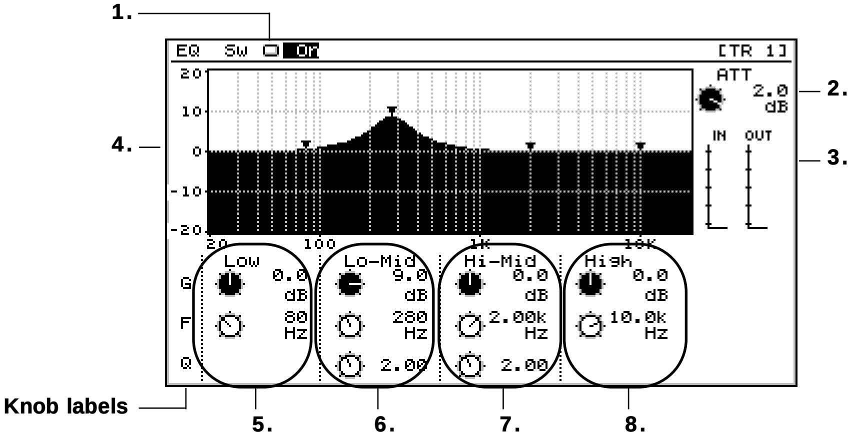
11. IN/OUT/GR Meters



The DYN screen provides three meters that let you see what the channel's dynamics processor is doing to its signal at any given moment. The:

- *IN meter*—shows the signal's original level coming into the dynamics processor.
- *OUT meter*—shows the signal's level coming out of the dynamics processor.
- *GR (Gain Reduction) meter*—shows the amount of gain reduction being applied.

The EQ Screen



To learn about the CH EDIT EQ screen's RESET button, see Page 163.

What Is EQ?

A sound wave is a repeating change in air pressure that your ear perceives as a sound. The sound wave changes over and over between its least amount of air pressure and its greatest *very* quickly—many, many times per second. The number of times it repeats this cycle in each second is called its "frequency." Frequencies are measured by single cycles (called "Hertz" or "Hz"), or by thousands of cycles ("kilohertz" or "kHz"). A low-frequency sound wave repeats its cycle fewer times per second than a high-frequency sound wave.

What's important about this is that a sound wave's frequency determines its pitch.

In fact, every sound you hear is made up of a mix of sound waves that occur so close together in time that the ear perceives them as one single sound. Each of these sound waves is occurring at its own frequency, of course. This means that every sound you hear is comprised of sound waves at a variety of pitches and at different volumes, all working together to create a single complex sound. The low-frequency sound waves make up its bass, while the high-frequency sound waves make up its treble range.

EQ, or "equalization," allows you to raise or lower the volume of specific sound waves within a sound, identifying the sound waves by their frequencies. By raising or lowering the volume of specific frequencies within a sound, you can change its character, making it brighter or warmer, harsher or sweeter. You can lower the volume of any frequencies you don't like in a sound, or make other frequencies louder.

A device that performs equalization is called an "equalizer," or simply "EQ" for short. Some equalizers divide up a signal into specific frequency ranges, or "bands," with a set of controls assigned to each band. A low band EQ adjusts the levels of bass frequencies, while a high band EQ operates on the treble content in a signal.

The Basic Mechanics of an Equalizer

All EQs use the same basic devices to do what they do. They all contain a:

- *frequency selector*—that allows you to select the desired frequency range by selecting the frequency at its center, sometimes called the "center frequency."
- *gain control*—that lets you turn the selected frequencies up or down in volume.

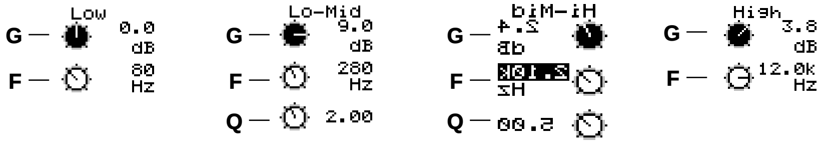
"Parametric" EQs also offer a Q, or bandwidth, control. This control lets you set the width of the affected range of frequencies below and above the center frequency.

You can find a frequency by turning up the EQ's gain and sweeping through the frequency values until you hear what you want. If you're using a parametric EQ, lower the Q. Once you've found the frequency, set the gain and Q as desired.

Here's an EQ tip: Set the gain control so that the sound changes the way you want it to, and then back off a little. This simple trick can really improve your EQ.

The EQ Screen Frequency-Based Tools

The EQ screen provides a set of tools with which you can alter the frequency content of the channel's signal: a filter and four bands of equalization.



G=gain control; F=frequency selector

This tool:	*Offers these controls:*
Low Band EQ	gain control and frequency selector
Lo-Mid Band EQ	gain control, frequency selector, Q control
Hi-Mid Band EQ	gain control, frequency selector and Q control
High Band EQ	gain control and frequency selector

The channel signal flows through the EQ screen from top to bottom in the chart above, or left-to-right onscreen.

1. EQ Sw

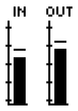
EQ Sw ☐ On

The EQ Sw ("EQ Switch") parameter turns the CH EDIT EQ on and off.

2. ATT

The EQ screen provides easy access to the ATT parameter that also appears on the CH EDIT VIEW screen. See Page 148.

3. EQ Meters

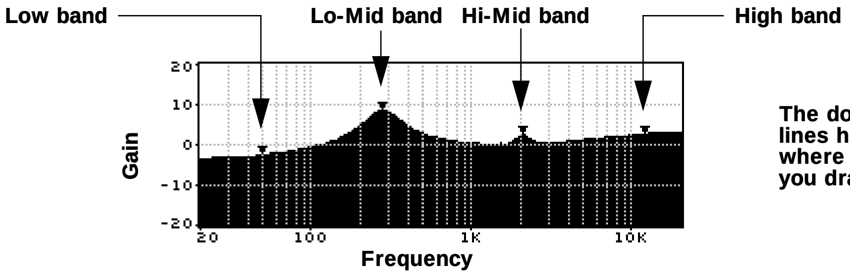


There are two meters on the EQ screen:

- The IN meter shows you the level of the signal as it enters the EQ screen.
- The OUT meter shows you the signal's level as it leaves the EQ screen.

4. Interactive EQ Display

The interactive EQ display shows you the settings of the four EQs. Each equalizer is represented by a triangle.

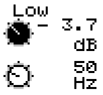


The dotted vertical lines help you see where you are as you drag a triangle.

You can change a band's gain and frequency values on the interactive EQ display with your mouse by dragging its triangle:

- left or right to lower or raise, respectively, change its frequency.
- down or up to lower or raise, respectively, its gain.

5. Low Band EQ

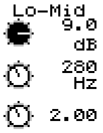


The Low EQ band operates on all frequencies below the selected frequency. It has a:

- *frequency selector*—that sets the center frequency, from 20 Hz to 1.00 kHz.
- *gain control*—that raises or lowers the level of the selected frequency range. It can be set anywhere from -15.0 dB to 15 dB.

The low band EQ is a shelving-type EQ that affects the level of all frequencies below the selected frequency, as well as a narrow range of frequencies slightly above it. As such, it requires no Q setting.

6. Lo-Mid Band EQ

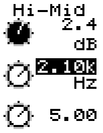


The Lo-Mid EQ band is a parametric EQ that contains a:

- *frequency selector*—that sets the center frequency, from 20 Hz to 20.0 kHz.
- *gain control*—that raises or lowers the level of the selected frequency range. It can be set anywhere from -15.0 dB to 15 dB.
- *Q*—that sets the width of the affect range of frequencies, from .36 to 16.0.

Although this EQ is called the "Lo-Mid" band, its wide range of frequency values means that you can use it to adjust the level of any frequencies in a signal, low *or* high.

7. Hi-Mid Band EQ

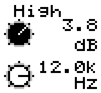


The Hi-Mid EQ band is a parametric EQ that contains a:

- *frequency selector*—that sets the center frequency, from 20 Hz to 20.0 kHz.
- *gain control*—that raises or lowers the level of the selected frequency range. It can be set anywhere from -15.0 dB to 15 dB.
- *Q*—that sets the width of the affect range of frequencies, from .36 to 16.0.

Although this EQ is called the "Hi-Mid" band, its wide range of frequency values means that you can use it to adjust the level of any frequencies in a signal, high *or* low.

8. High Band EQ



The high band EQ operates on all frequencies above the selected frequency. It has a:

- *frequency selector*—that sets the center frequency, from 1.00 kHz to 20.0 kHz.
- *gain control*—that raises or lowers the level of the selected frequency range. It can be set anywhere from -15.0 dB to 15 dB.

The high EQ band is a shelving-type EQ that affects the level of all frequencies above the selected frequency, as well as a narrow range of frequencies slightly beneath it. As such, it requires no Q setting.

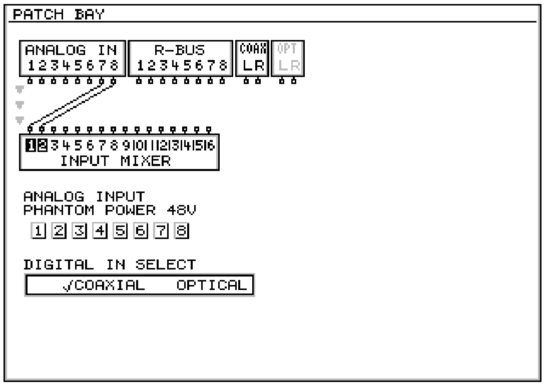
The FX Ins Screen

The FX Ins ("Effect Insert") screen is discussed in Chapter 16—see Page 211.

The Surrnd Screen

The Surrnd ("Surround") screen is described in Chapter 24, on Page 310.

The CH EDIT P.BAY Screen



You can assign an input signal to the current input channel on its CH EDIT P.BAY screen. This screen operates similarly to the EZ ROUTING P.BAY screen (Page 132), though without the virtual "wires." To learn the basics of routing input jacks and digital connectors to input channels in the VS-2400CD, see "Digital Input Signals" on Page 127.

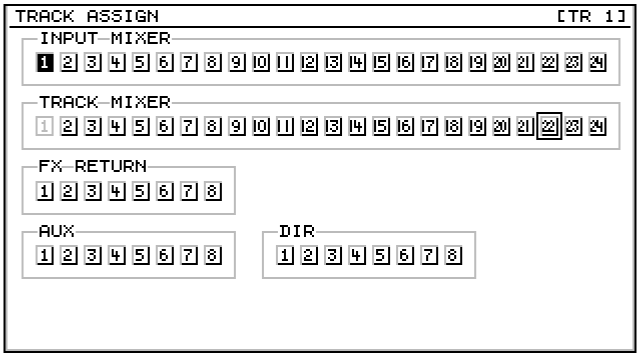
To route an input jack or connector to the current input channel on this screen:

- use the cursor buttons to select the desired input pair (Page 131) and turn the TIME VALUE dial clockwise—each odd or even input highlights to show that it's routed to the channel. To disconnect the input, turn the Time/Value dial counter-clockwise.
- click the desired input pair with your mouse. The corresponding odd or even input highlights to show it's routed to the channel. To disconnect the input, click it again.

The P.BAY screen makes available only those digital inputs that are currently active according to the settings of the DIGITAL IN SELECT parameter. This parameter are explained in "Turning On the Coaxial or Optical Digital Inputs" on Page 127.

Only one input at a time can be routed to an input channel. When you route a new input to the channel, the previous one is automatically disconnected.

The CH EDIT ASSIGN Screen


TRACK ASSIGN
[TR 1]
INPUT MIXER
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
TRACK MIXER
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FX RETURN
1 2 3 4 5 6 7 8
AUX
1 2 3 4 5 6 7 8
DIR
1 2 3 4 5 6 7 8

The 24 input channels

Tracks

The eight FX returns

The eight Aux Busses

The eight Direct Paths

On a track channel's ASSIGN screen, you can route input channel, FX return, Aux bus and Direct path signals, or other tracks, to the current channel's track for recording. The screen acts like the EZ ROUTING VIEW screen (Page 278), but without virtual "wires."

To route an input channel's signal or another track to the current channel's track:

- use the cursor buttons to select the desired signal source and turn the TIME VALUE dial clockwise—the selected signal source highlights to show that it's routed to the current channel's track. To disconnect the source, turn the Time/Value dial counter-clockwise.
- click the desired signal source with your mouse—the selected signal source highlights to show that it's routed to the current channel's track. To disconnect the source, click it again.

You can route as many input channel signals or tracks to the current channel's track as you like.

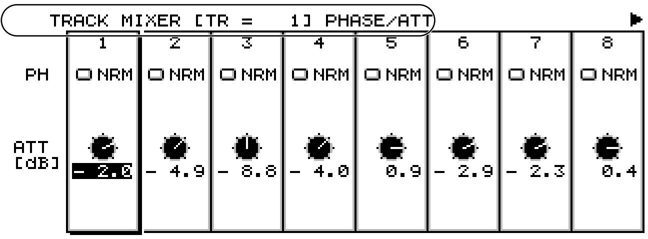
If you select a stereo source—linked input channels, tracks or Aux busses—both linked signals will be combined and routed into the current channel's track. If the current channel's linked to another channel, the left side of the source signal will go to the odd-numbered track and the right side to the even-numbered track.

Parameter View

Selected channel and parameter (group)

Parameter

Parameter


TRACK MIXER [TR = 1] PHASE/ATT
1
2
3
4
5
6
7
8
PH
NRM
ATT [dB]
- 2.8
- 4.9
- 8.8
- 4.0
0.9
- 2.9
- 2.3
0.4

The CH EDIT PRM.V (for "Parameter View") feature allows you to view a selected CH EDIT parameter in multiple channels at the same time. You can also adjust the parameter in any of the displayed channels. This can save you time when you need to adjust the same parameter in a group of channels.

To activate the Parameter View, press F6 (PRM.V) from any CH EDIT screen. On a track channel's CH EDIT VIEW screen, however, F6 (PRM.V) is unavailable when the STATUS parameter is selected—choose another parameter to activate F6 (PRM.V).

To return to the normal CH EDIT display, press F6 (CH.V).

At the bottom of the Parameter View screen is a set of four tabbed layers that contain an F button for each of the viewable parameters or parameter groups for the current channel. Press the desired F button. To reveal an F button that's currently hidden, tap PAGE until the tabbed layer it's on appears. There are also F buttons for the DYN and EQ screens that show all their parameters at once, as described below.

The F2 (Surrnd) button is active only when the UTILITY menu's SURROUND MIX Sw parameter (Page 309) is turned on.

At the left side of the screen, you'll see the displayed parameter's name. If a group of related parameters is in view, each is labeled at the left side of the screen.

The Parameter View screen can't always show all of the channels' settings for a parameter at the same time. When all of the channels won't fit onscreen at once, you'll see an arrow pointing to the right at the right-hand side of the screen. You can press ▶ or click the arrow with your mouse to view the remaining channels, or ◀ to go back.

In some cases, you'll see up and down arrows at the left edge of the screen. In general, these mean that there's more to see above and/or below the current view—you can press ▼ or ▲, or click either arrow with your mouse. What happens when you click one of the arrows depends on what's being viewed.

When the PRM.V screen shows:	*Use the up and/or down arrows to view:*
DYN parameters	the DYN screen's expander and compressor parameters. See Page 152. At the top of the PRM.V section of the display, you'll see the name of the currently displayed set of dynamics parameters. When the dynamics processor is set to compressor, all expander-related parameters are hidden, and vice versa.
EQ parameters	all of the EQ screen's parameters. See Page 157.
FXIns parameters	the effect insert settings—and patch name—for each of the available effects, one at a time. See Page 210. At the top of the PRM.V section of the display, you'll see the name of the currently displayed effect.
AUXSnd parameters	the Aux send settings for each of the eight Aux busses, one at a time. See Page 148. At the top of the PRM.V section of the display, you'll see the name of the currently displayed Aux send.

If you edit a parameter while in Parameter View, its channel automatically becomes the currently selected channel.

Hold down SHIFT and press ▲ or ▼ to view the previous or next parameter's Parameter View screen, respectively.

Hold down SHIFT and press ▲ or ▼ to view the currently settings' Parameter View screen for the previous or next channel, respectively.

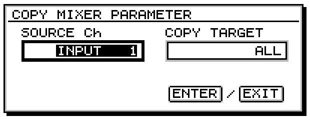
Assorted CH EDIT Tools

The CH EDIT VIEW CpyPRM Button

CpyPRM

You can copy another input or track channel's parameter values to the current channel from the current channel's CH EDIT VEW screen. To do this:

1. Press F5 (CpyPRM)—the COPY MIXER PARAMETER dialog opens.



COPY MIXER PARAMETER

SOURCE Ch: INPUT 1

COPY TARGET: ALL

2. Set the SOURCE Ch parameter to the channel whose parameters you'd like to copy. You can select any input or track channel.
3. The COPY TARGET select the parameters you want to copy to the current channel.

Select:	*To copy:*
ALL	all of the source channel's parameter settings to the current channel.
DYNAMICS	all of the source channel's DYN screen parameter settings to the current channel.
EQ	all of the source channel's EQ screen parameter settings to the current channel.
LEVEL	the source channel's FADER and Aux send levels to the current channel.

The CpyPRM feature doesn't copy the following track-channel-only parameters—STATUS, V.Trk, PlyMod.

The DYN and EQ Screen RESET Buttons

RESET

If you'd like to start with a clean slate as you set up a channel's dynamics processing or EQ, reset all of the CH EDIT DYN and EQ parameters by pressing F5 (RESET).

12—Working with Input Channels

Introduction to Input Channel Routing

This chapter discusses what to do with an input channel's signal once you've got it sounding the way you want. If you'd like to learn about:

- routing an analog input jack or digital connector to an input channel, see Chapter 9.
- using the VS-2400CD's digital mixer, see Chapter 10.
- shaping each input channel's signal, see Chapter 11.

You can send an input channel's signal to:

- *a track in the VS-2400CD's hard disk recorder*—the most common destination for an input channel's signal in the VS-2400CD. You can route as many signals to the same track as you want. Once the signal's been routed to a track, it can be recorded on the track.
- *the MASTER mix*—You'll want to route an input channel's signal into the MASTER mix before you're ready to send it to a track for recording. You'll also want to route input channel signals into the MASTER mix when you're combining live audio input signals with recorded tracks in your final mix. This would be the case when you're running a MIDI sequencer alongside your recorded VS-2400CD tracks.
- *a Direct path*—on which it can be carried to an internal effect or an output on its way to an external device such as an external multitrack recorder.
- *an Aux bus*—You can send an input channel's signal to an Aux bus on which it can travel to one of the VS-2400CD's internal effects, or through an output to an external device such as a headphone amplifier or an external effect processor.

In the following sections, we'll discuss how to route input signals to the first three of these destinations—Chapter 15 discusses how to send signals to the Aux busses.

Routing Linked Stereo Input Channels

When you're bringing stereo audio into the VS-2400CD, you can link the input channel that's controlling the left side of the stereo image with the input channel that's controlling the right side by turning on the CH EDIT ChLink parameter (see Page 147).

When input channels are linked, they act as single object for routing purposes. On routing screens that show virtual wires, one wire connects both input channels to the desired destination. You can connected a linked pair of input channels to a single track or to pair of tracks whose track channels are linked (Page 147)—linked track channels share a single connection point. If you connect the linked input channels to:

- *a single track*—both input channels' signals are combined onto the selected track.
- *a linked pair of tracks*—the left input channel's signal goes to the odd-numbered track, and the right input channel's signal goes to the even-numbered track.

In the same way a linked pair of input channels acts as a single stereo object during routing, a linked pair of tracks acts as a single stereo destination.

Routing an Input Channel Signal to a Track

When you've routed a signal to a track for recording, the signal can be recorded on the track's currently selected V-Track. To learn more about V-Tracks, see Page 85.

You can route an input signal to a track in any of three ways in the VS-2400CD:

- You can use the fast and easy Quick Routing mode, described below.
- You can route the signal to the track on the EZ ROUTING VIEW screen (Page 168).
- You can also route a signal to a track right from within its input channel using the CH EDIT ASSIGN screen, as described on Page 161.

While the following sections describe routing single input channels and tracks, linked input channels and tracks behave just like their unlinked counterparts during routing.

You can save any routing you create as an EZ Routing template. See Chapter 22 to learn about EZ Routing templates.

When an Input Channel is Routed to a Track

When the track is record-enabled or recording—so its TRACK STATUS buttons is flashing red or lit solidly red—the VS-2400CD automatically removes the input channel's signal from the MASTER bus. This prevents your hearing the signal through the input channel and the track's channel at the same time. When you record, you'll hear only the track channel so you know what the track is "hearing" and thus what it'll record.

As soon as the track is set to play back or turned off—so its TRACK STATUS button is green or unlit, respectively—the VS-2400CD returns the input channel's signal to the MASTER bus. If you don't want to hear the input signal, and don't want to unplug its source or lose its fader setting, you can remove it from the mix manually—see Page 169.

Quick-Routing Input Channels to Tracks

Quick Routing begins with the selection of the desired destination track—once you've selected the track, you route the desired signal to it. In Quick Routing mode, the TRACK STATUS buttons select a destination track and the FADER and SELECT buttons select the source input channel signals you want to send to the track.

In Quick Routing, the CH EDIT/SELECT/AUTOMIX STATUS buttons are referred to as simply "SELECT" buttons, since they select source signals.

- One FADER button lights solidly to tell you that the SELECT buttons apply to that group of source channels—it also shows the tracks the TRACK STATUS buttons control, as explained in the table at the top of the next page.
- The TRACK STATUS button for the currently selected track channel solidly lights to show that its track is the destination track.
- The SELECT button for any channel routed to the selected track lights solidly.

All other FADER, SELECT and TRACK STATUS buttons flash. Route each desired input channel to the track by pressing the input channel's SELECT button.

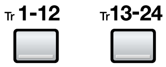
You can also route other tracks, Aux busses and FX return channels to tracks using Quick Routing.

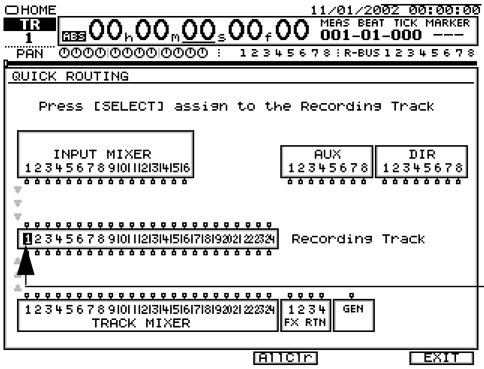
How the FADER Buttons Act in Quick Routing

When you press:	*The SELECT buttons route:*	*Press a TRACK STATUS button to:*
IN 1-12	Input Channels 1-12	select Track 1-12 as a destination
IN 13-16	Input Channels 13-16	select Track 13-24 as a destination
Tr 1-12	Track Channels 1-12	select Track 1-12 as a destination
Tr 17-24	Track Channels 13-24	select Track 13-24 as a destination
AUX 1-8/FX 1-4	Aux Busses 1-8 and FX Returns 1-4	select Track 1-12 as a destination

To Quick-Route an Input Signal to a Track

1. Press the FADER button that selects the group of track channels containing the desired destination track's channel.
2. Hold down the desired track channel's TRACK STATUS button for a second or so until the QUICK ROUTING screen appears.


Tr 1-12
Tr 13-24


HOME
11/01/2002 00:00:00
TR 1
ABS 00h00m00s00f00
MEAS BEAT TICK MARKER
001-01-000 ---
PAN
1 2 3 4 5 6 7 8 : R-BUS 1 2 3 4 5 6 7 8
QUICK ROUTING
INPUT MIXER
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
AUX
1 2 3 4 5 6 7 8
DIR
1 2 3 4 5 6 7 8
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
Recording Track
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
TRACK MIXER
1 2 3 4
FX RTN
GEN
AllClr
EXIT

Press [SELECT] assign to the Recording Track

Input Channels 1-16

Hard Disk Recorder Tracks 1-24

In this illustration, we've cleared all connections for visual clarity. When you create a new project, Input Channels 1-16 are already routed to Tracks 1-16.

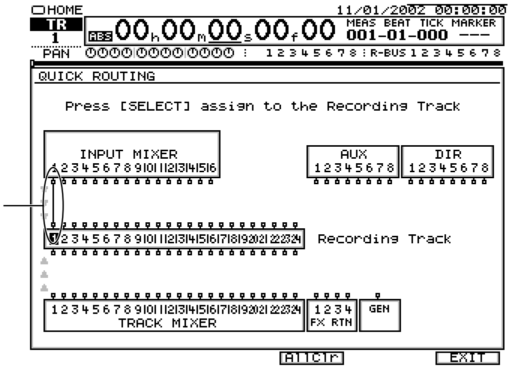
We selected Track 1. It flashes to show it's selected.

The FADER button you pressed in Step 1 and the TRACK STATUS button you held down in Step 2 light solidly to show the currently active group of SELECT buttons and the current destination track. If any channels are already routed to the track, their SELECT buttons also light solidly.

To clear all of a track's routings, hold down its TRACK STATUS button and press CLEAR. To clear all of the QUICK ROUTING screen's connections, press F4 (AllClr).

3. Press the FADER button for the set of input channels containing the one whose signal you want to route to the track.
4. Press the desired input channel's SELECT button—a virtual wire appears on the screen to show the connection you've made.

IN1-12
IN13-16


HOME
11/01/2002 00:00:00
TR 1
ABS 00h00m00s00f00
MEAS BEAT TICK MARKER
001-01-000 ---
PAN
1 2 3 4 5 6 7 8 : R-BUS 1 2 3 4 5 6 7 8
QUICK ROUTING
INPUT MIXER
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
AUX
1 2 3 4 5 6 7 8
DIR
1 2 3 4 5 6 7 8
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
Recording Track
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
TRACK MIXER
1 2 3 4
FX RTN
GEN
AllClr
EXIT

Press [SELECT] assign to the Recording Track

We pressed Input Channel 1's CH EDIT button

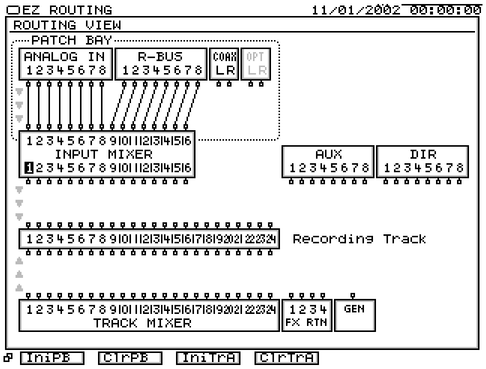
The gray arrows at the left edge of the screen show the direction in which signal flows.

5. If you want to break the connection press SELECT again.

6. To route another signal to the track, repeat Step 3, if necessary, and Step 4.
7. To select another destination track, press the desired track's TRACK STATUS button—it lights solidly to show that it's now the Quick Routing destination track. If the track you want isn't in the current active group of track channels, press the track's FADER button and then its TRACK STATUS button.
8. Repeat Steps 3 and 4 to select the input channel signal you want to send to the track.
9. When you've finished, press F6 (EXIT) to confirm your routing and leave Quick Routing mode.

Input Signal Routing on the EZ ROUTING VIEW Screen

1. Press EZ ROUTING.


EZ ROUTING
11/01/2002 00:00:00
ROUTING VIEW
PATCH BAY
ANALOG IN 12345678
R-BUS 12345678
COAX LR
OPT LR
12345678910111213141516
INPUT MIXER
12345678910111213141516
AUX 12345678
DIR 12345678
123456789101112131415161718192021222324
Recording Track
123456789101112131415161718192021222324
TRACK MIXER
1234 FX RTN
GEN
IniPB
ClrPB
IniTrA
ClrTrA

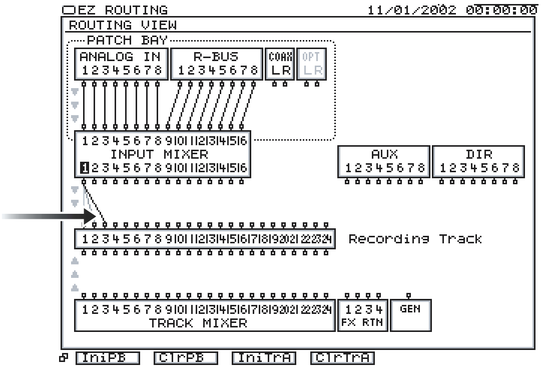
Input channels 1-16 —

Hard Disk Recorder Tracks 1-24 —

In this illustration, we've cleared all track connections for visual clarity. When you create a new project, Input Channels 1-16 are already routed to Tracks 1-16.

The gray arrows at the left edge of the screen show the direction in which signal flows.

2. If the ROUTING VIEW screen doesn't appear, and you see "VIEW" above F1, press F1 (VIEW)—if you don't see "VIEW" above F1, press PAGE and then F1 (VIEW). The INPUT MIXER block provides connections for bringing signals into the 16 input channels—at the top of the block—and the outputs from the 16 input channels at the bottom of the block.
3. Use ◀, ▶, ▲ and/or ▼ to select the desired input channel's output along the lower edge of the INPUT MIXER block. We've selected Input Channel 1's output in the illustration above.
4. Turn the Time/Value dial clockwise—as you turn it, a wire appears that connects the input channel to one track after another in the RECORDING TRACKS block.


EZ ROUTING
11/01/2002 00:00:00
ROUTING VIEW
PATCH BAY
ANALOG IN 12345678
R-BUS 12345678
COAX LR
OPT LR
12345678910111213141516
INPUT MIXER
12345678910111213141516
AUX 12345678
DIR 12345678
123456789101112131415161718192021222324
Recording Track
123456789101112131415161718192021222324
TRACK MIXER
1234 FX RTN
GEN
IniPB
ClrPB
IniTrA
ClrTrA

5. Turn the dial in either direction to select the desired destination track.
6. To break the connection between an input channel and a track, repeat Steps 3 and 4, and turn the Time/Value dial counter-clockwise until no connections exist.

Input Channel Signals and the Main Mix

Removing Input Channel Signals from the Main Mix

When you create a new project, the VS-2400CD's input channels are routed into the MASTER mix to help ensure that you can easily hear their signals even before you route them to tracks. Once you *have* routed them to tracks, and recorded their signals, it can be a good idea to remove them from the main mix. When you play back your project, you'll be able to hear your tracks without also hearing unwanted audio coming through your input channels.

If you have live mics connected to inputs, you may experience feedback from monitor speaker or headphone signals leaking into the mics. Taking the input channels out of the main mix is a good way to avoid this problem.

The idea is to remove the input channel's signal from the MASTER mix. This method spares you from having to disconnect the input signal's source from the VS-2400CD or lowering its input channel fader in case you'll want to send it back into the mix later on.

Removing Input Signals from the MASTER Mix

Press the desired IN 1-12 or IN 13-16 button to select the group of channels containing the input channel you want to remove from the mix.

1. Press the desired input channel's CH EDIT button—the input channel's CH EDIT VIEW screen appears.
2. Turn MIX (Page 149) off.
3. Press the CH EDIT button for any input channel you've routed to a track and turn its MIX parameter off.

Adding an Input Channel's Signal to the Main Mix

If you need to add an input channel back into the mix after having de-activated its send to the MASTER bus, it here's how.

Sending an Input Channel's Signal into the Main Mix

1. Press the desired IN 1-12 or IN 13-16 button.
2. Press the channel's CH EDIT button.
3. Turn the channel's MIX parameter on (Page 149).

IN1-12
IN13-16

Routing an Input Channel Signal to a Direct Path

To route an input channel's signal into the MASTER mix:

1. Press the desired IN 1-12 or IN 13-16 button.
2. Press the channel's CH EDIT button.
3. Turn on the desired Direct path's on/off switch (Page 151).

IN1-12
IN13-16

To learn about more about Direct paths, see Chapter 15.

13—Operating the Hard Disk Recorder

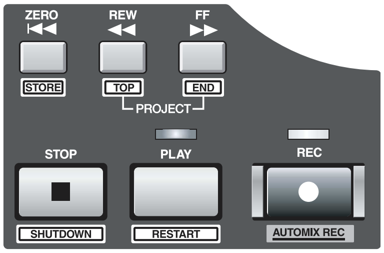
This chapter discusses the mechanics of using the VS-2400CD's hard disk recorder—basically, it's all about recording and playing back a project. We'll describe the recorder's tools for navigating a project and for playing it back in a variety of ways.

If you're not clear on what the hard disk recorder is and what it does, see "The Hard Disk Recorder" on Page 55. To learn the fundamentals of how it records and plays back audio—and how its built-in hard disk works—see Chapter 6, starting on Page 83.

You can reverse any recording action using the VS-2400CD's Undo and Redo features, described on Page 70.

The Transport Buttons

The Main Transport Buttons



The most basic tools you have for recording and playing a project—and running the hard disk recorder—are the transport buttons.

Press:	*To:*
PLAY	begin playback from the now line's current position in the project.
STOP	halt playback at the now line's current position.
REC	begin recording any armed tracks, as described on Page 173.
ZERO	return to Time 00h00m00s00f00, the very beginning of the project.
REW	move back in time through the project
FF	move forward in time through the project

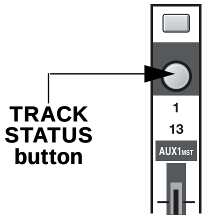
The buttons perform other tasks when SHIFT is held down. STORE is described on Page 47, SHUTDOWN and RESTART on Page 78, and AUTOMIX REC in Chapter 25.

Special Transport Buttons

In addition to the main transport buttons, you can jump to the:

- *the beginning, or "top," of the project's audio*—by holding down SHIFT and pressing REW•PROJECT TOP.
- *the end of the project's recorded audio*—by holding down SHIFT and pressing FF•PROJECT END.

The TRACK STATUS Buttons



When the channel strips are controlling the track channels—when TR 1-12 or TR 13-24 is lit—each TRACK STATUS button sets the behavior of its corresponding track.

How the TRACK STATUS Buttons Work

Each time you press a TRACK STATUS button, you change the current operating mode of the corresponding track. (We'll mention some shortcuts for doing this later on.) The TRACK STATUS button's color shows you the track's current state:

If the button is:	*The track:*
Not lit	is turned off. No recording or playback will occur.
Green	is set to play back what's recorded on the track.
Flashing red	is ready, or "armed," for recording. What you hear depends on the RECORD MONITOR parameter's setting (Page 185).
Flashing red and amber	is armed for recording with the source signal being heard when RECORD MONITOR is set to Auto (Page 185).
Solidly lit red	the track is in the process of recording.

Recording

This section describes recording a single mono track. If you'd like to record stereo audio across a pair of tracks, link their track channels (Page 147) and use the same procedure.

Before Recording a Track

Select a V-Track

When you record a track, you're recording audio on the track's currently selected V-Track—to learn what a V-Track is, see Page 84. You can select a V-Track on the Home screen's V-Track map (Page 119) or by setting the corresponding track channel's CH EDIT V.Trk parameter (Page 147). In either case, you'll need to select the desired V-Track before recording.

Set Up Your Routing

Before you can record a signal, you've got to get it to the track:

1. Route the signal to an input channel. To learn how to do this, see Page 130.
2. Route the input channel's signal to the track or pair of tracks. See Page 166.

Set Up Your Monitoring and Shape the Signal to Taste

During recording, you'll typically monitor the MASTER mix. Make sure the MASTER fader is set as desired and set the track's channel fader to 0 so you can hear the track.

If you're sure you want to make permanent changes to the signal's sound before recording, use the input channel's CH EDIT tools (Chapter 11) to do so. Otherwise, shape its sound using its track channel CH EDIT parameters. Set the input channel's fader—and FADER parameter, therefore—to the desired recording level. For tips on recording levels, see "How Do I Get Good Levels?" on Page 58.

Recording a New Track

1. Press ZERO to return to the beginning of the project.
2. Hold down REC and press the track's TRACK STATUS button. It flashes red to show that the track is armed and ready to be recorded.
3. Press REC—it, too, flashes to show that you're about to record.
4. Press PLAY—recording starts. REC and the TRACK STATUS button light solid red.
5. To halt recording the track, press STOP.
6. If you want to record the track again, repeat Steps 1-5.
7. To play back the track, press ZERO and then PLAY.

If the RECORD MONITOR PlayRec parameter (Page 185) is set to Source, hold down STOP and press the TRACK STATUS button before pressing ZERO and PLAY.

If you've finished recording a track, make sure that its TRACK SELECT button is green or unlit before moving on to ensure that you don't accidentally record over the track.

You can re-record any part of an already recorded track by punching—see Page 185.

Playback

Basic Playback Procedure

Playing Back Recorded Tracks

1. Press TR 1-12 and TR 13-24 and make sure that the TRACK STATUS button for any track you want to play back is lit green.

Here's a shortcut for setting a TRACK STATUS button to green for playback. Hold down STOP and press the desired TRACK STATUS button.

2. Bring up the track channel faders for any track you want to hear to the desired position—or to 0, if you're not sure—and make sure the MASTER fader is set to 0.
3. Set your listening level as described on Page 74.
4. Press ZERO to return to the very beginning of the project, or hold down SHIFT and press REW to go to the beginning of the project's recorded audio.
5. Press PLAY to begin playback.
6. Press STOP to halt playback.

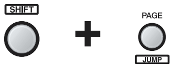
You can begin playback from anywhere in the project by placing the now line at the desired location and hitting PLAY.

Moving Through a Project

You can place the now line in a variety of ways, including:

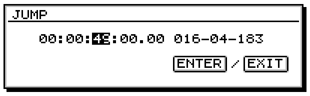
- using the current time location display (Page 122)
- locators (Page 179)
- markers (Page 182)
- the position bar (Page 118) found on many of the VS-2400CD screens
- the Jump feature—see below.

Using Jump



The VS-2400CD’s Jump feature allows you to quickly move the now line to any location in the project:

1. Hold down SHIFT and press PAGE•JUMP—a dialog appears showing you the location to which you can jump.


JUMP

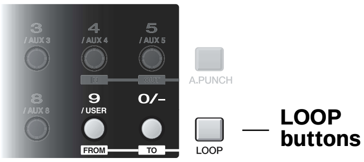
00:00:43:00.00 016-04-183

2. You can select a new desired location in any of few ways. You can:
   - use the cursor buttons and the Time/Value dial to select anew destination.
   - press NUMERICS (Page 72) and enter the desired location on the keypad.
3. Press ENTER/YES to move the now line to the selected location.

If you need to enter a long string of numbers as a Jump destination using the keypad, select the right-most part of the number on the display first—each digit you enter from the keypad pushes the other numbers leftward by default. You can change this behavior by resetting the UTILITY menu’s NUMERICS TYPE parameter. See Page 356.

Looped Playback

You can loop a section of a project so that it plays over and over. This can be handy when a section needs rehearsal, or when you’re punching a section over and over as a performance is perfected (see Page 186.)



To use the Loop feature, you must first tell the VS-2400CD where you want the looped section of the project to begin and where you want it to end by setting loop FROM and TO points, respectively. You can do this in a variety of ways.

Setting Loop Points When a Project Isn’t Playing

1. Move the now line to the beginning of the section to be looped.
2. Hold down LOOP and press FROM.
3. Move the now line to the desired loop end location.
4. Hold down LOOP and press TO.
5. If you need to re-set either point, move the now line to the desired location, hold down LOOP and press the FROM or TO button.

Setting Loop Points While a Project Is Playing

For this entire process, hold down the LOOP button until instructed otherwise.

1. Start playback shortly before the location at which you want the loop to start.
2. Hold down LOOP.
3. Without releasing LOOP, press TAP at the top of the section you want to loop.
4. Continue holding down LOOP and press TAP at the end of the section.
5. Release LOOP.

Clearing Loop Points

1. Hold down LOOP and CLEAR and press the FROM or TO button to clear the current LOOP FROM or TO point, respectively.

Setting Loop Points Using Locators

You can learn about locators on Page 179. The following steps presume you've already placed locators at the beginning and end of the section you want to loop.

1. Press LOCATOR—so it's lit—and select the locator bank containing the locators you've placed at the start and end of the section you want to loop.
2. Press the locator positioned at the start of the section.
3. Hold down LOOP and press FROM.
4. Press the locator positioned at the end of the section.
5. Hold down LOOP and press TO.

Setting Loop Points Using Markers

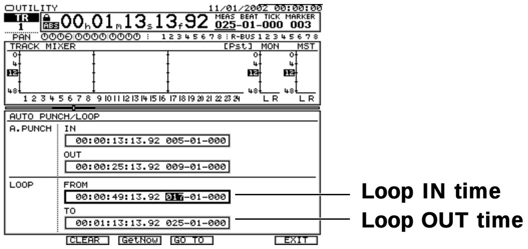
Markers are described on Page 182. Before setting your Loop FROM and TO points, place markers at the beginning and end of the section to be looped.

1. Move to the marker located at the start of the section.
2. Hold down LOOP and press FROM.
3. Move to the marker located at the end of the section.
4. Hold down LOOP and press TO.

Editing Loop FROM and TO Points Manually

You can edit, clear and place Loop Punch FROM and TO points on the AUTO PUNCH/LOOP screen in the UTILITY MENU.

1. Hold down SHIFT and press LOOP—the AUTO PUNCH/LOOP screen appears.



AUTO PUNCH/LOOP
A.PUNCH IN 00:00:13:13.92 005-01-000
OUT 00:00:25:13.92 009-01-000
LOOP FROM 00:00:49:13.92 017-01-000
TO 00:01:13:13.92 025-01-000

You can do a few things with your Auto Punch IN and OUT points on this screen:

- You can use the cursor buttons and Time/Value dial, or your mouse, to change either point's location by time code or measures and beats.
- You can select FROM or TO on the screen and press F2 (CLEAR) to erase its current time assignment.
- You can grab the now line's current position as a new FROM or TO point. Select FROM or TO on the screen and click F3 (GetNow).
- You can move the now line to an FROM or TO location by selecting FROM or TO on the screen and clicking F4 (GO TO).

2. Press EXIT when you're done to confirm your changes.

Activating Looped Playback

1. Move the now line to a location shortly before the section you'll be looping.
2. Press LOOP so it's lit.
3. Press PLAY—when the VS-2400CD reaches the LOOP TO point, it starts over again at the LOOP FROM point, playing the looped section over and over again.
4. Press STOP to halt playback.
5. To turn looping off, press LOOP so it's not lit.

Vari Pitch Playback

You can play—and record—a project at different speeds to raise or lower the pitch of its recordings. There are a few situations in which you might want to do this:

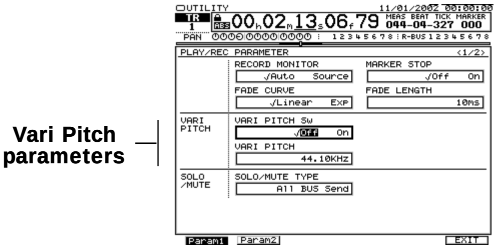
- You might need to record a new track using an instrument that can't be easily retuned to your already recorded tracks, such as a piano or organ.
- You can record a track at an abnormally slow or fast speed so that when the project is returned to normal speed, the track sounds sped-up or slowed down as a special effect.

Audio CDs can only hold audio that's at a 44.1kHz sample rate. If you plan to burn your project onto a CD, don't use Vari Pitch to set the project's normal playback speed—use it only during recording.

When you use Vari Pitch playback, the number of available project tracks may decrease. In addition, the use of Vari Pitch may alter effect delay times and may change the sound of distortion effects.

Activating Vari Pitch

1. Hold down SHIFT and press F4•UTILITY.
2. If you don't see "PlyRec" above F4, press PAGE until you do.
3. Press F4 (PlyRec).


Vari Pitch parameters
UTILITY
11/01/2002 00:00:00
TR 1
ABS 00h02m13s06f79
MEAS BEAT TICK MARKER
044-04-327 000
PAN
1 2 3 4 5 6 7 8 R-BUS 1 2 3 4 5 6 7 8
PLAY/REC PARAMETER
<1/2>
VARI PITCH
SOLO /MUTE
Param1
Param2
EXIT

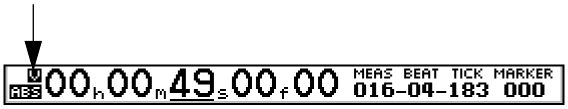
RECORD MONITOR: √Auto Source
MARKER STOP: √Off On
FADE CURVE: √Linear Exp
FADE LENGTH: 10ms
VARI PITCH Sw: √Off On
VARI PITCH: 44.10KHz
SOLO/MUTE TYPE: All BUS Send

4. Turn VARI PITCH Sw on to activate the Vari Pitch feature—the VS-2400CD takes a few moments to switch to Vari Speed operation.

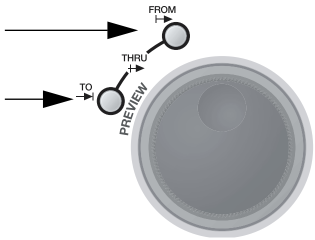
   VARI PITCH sets the project's playing speed—its default value is the project's sample rate. Higher values speed up playback, lower values slow it down.
5. Set the VARI PITCH parameter from 16.00kHz to 50.00kHz.
6. Press F6 (EXIT) to confirm your changes.

Probably the easiest way to calculate the desired VARI PITCH setting is to figure out the percent of pitch change you need using a tuner, and multiply the project sample rate by the percentage to arrive at the right VARI PITCH setting.

When Vari Pitch is turned on, a small V appears to the left of the current time in the VS-2400CD's display.

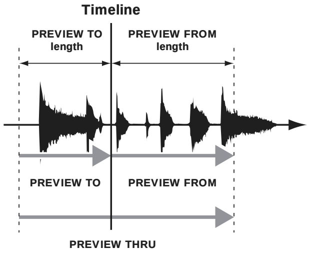

V
ABS 00h00m49s00f00
MEAS BEAT TICK MARKER
016-04-183 000

Preview



The VS-2400CD's Preview feature plays a few moments of the project just before and/or after the now line's current position. This can be handy when you're trying to find the precise time at which a recorded event occurs when you're placing locators (Page 179) or markers (Page 182). You can set the preview length as described on the next page.

There are three PREVIEW functions. Press:



- *PREVIEW TO*—to play a few moments of the project leading up to the now line's current position.
- *PREVIEW FROM*—to play a few moments of the project starting at the current position of the now line.
- *PREVIEW TO and PREVIEW FROM*—to play a few moments leading up to the now line, on through to a few moments after the now line. This is called "PREVIEW THRU."

Pinpointing an Event with the PREVIEW Buttons

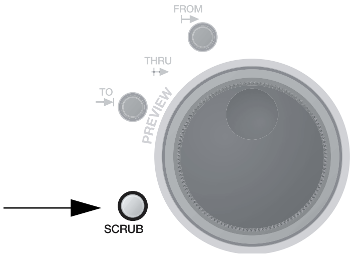
1. Position the now line in the general area of the event you want to pinpoint, noting its position in the current time location display.
2. Press PREVIEW TO to see if the preview reaches the event or plays right through it.
3. If PREVIEW TO doesn't reach the event, move the now line forward in time slightly. If it plays through the event, move the now line back a little.
4. Press PREVIEW TO again.
5. Repeat Steps 2-4 until the preview ends just at the beginning of the event.
6. Note the now line's current position and press PREVIEW FROM.
7. Make sure that none of the event is being chopped off at the front, and that as soon as you hit PREVIEW FROM, you hear the event.
8. Adjust the now line's position as necessary, checking it with PREVIEW FROM.
9. When you're satisfied that you have the now line positioned at the moment at which the event occurs, place a locator or a marker so that you can easily return to the event as you need to.

In the above instructions, we used both PREVIEW TO and FROM. You may not always need to use both to find the location you're looking for.

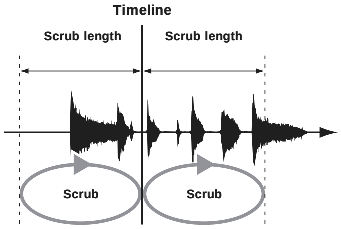
Setting the PREVIEW TO and FROM Times

1. Hold down SHIFT and press F4•UTILITY.
2. If "PlyRec" isn't displayed above F4, press PAGE until it is.
3. Press F4 (PlyRec).
4. Press F2 (Param2).
5. Set PREVIEW TO LENGTH and PREVIEW FROM LENGTH to the desired times, in tenths of a second, from 1.0 sec to 10.0 sec.
6. Press F6 (EXIT) to confirm your changes.

Scrub



When you want to find an audio event with absolutely microscopic precision—such as when you're editing tracks—use the Scrub feature. Scrub plays a tiny piece of the project quickly over and over so that by moving the now line in small increments, you can find exactly what it is you're looking for. You can listen just before or just after the now line, and can change the duration of the audio you hear during scrubbing.



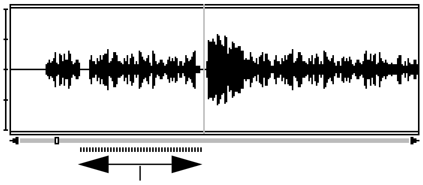
Finding an Event with Microscopic Precision Using Scrub

If you're looking for an event in a single track, you may find it useful to switch to the wave display's microscopic view (Page 235) when you're searching for exact locations using the Scrub feature. It'll let you see what you're hearing.

1. Press STOP if the project's playing.
2. Press HOME•DISPLAY.
3. Move the now line to the general location of the event you want to locate.
4. Select the track containing the event you seek.
5. Press WAVE DISPLAY to view the track's audio in a magnified view.
6. Press PLAY and visually locate the event you're looking for.
7. Turn the Time/Value knob to move the now line back to just in front of the event.
8. Press SCRUB—you hear the VS-2400CD play a short chunk of audio over and over.

Scrub typically plays such a short fragment of audio that you won't see the now line moving in the wave display as it works.

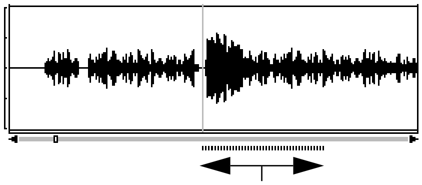
9. Press PREVIEW TO.
   The VS-2400CD previews the audio just before the now line, and sets Scrub so that it plays a tiny chunk of audio leading up to the now line.



The gray bar beneath the waveform shows you what SCRUB TO plays

10. In the current time location display, underline the subframe time value so you can move the now line in tiny time increments.
11. Turn the Time/Value dial slowly to pinpoint the now line position just before the event.
12. Press PREVIEW FROM.

After the VS-2400CD previews the audio starting at the now line it sets Scrub to play from the event and on.



The gray bar beneath the waveform shows you what SCRUB FROM plays

13. Turn the Time/Value dial to set the now line so it's the very start of the event.
14. Press SCRUB again to turn it off.
15. Place a locator (Page 179) or marker (Page 182) at the now line's position—you can use the locator or marker to move to this spot during track editing.

Setting Scrub Times

1. Hold down SHIFT and press F4•UTILITY.
2. If "PlyRec" isn't displayed above F4, press PAGE until it is.
3. Press F4 (PlyRec).
4. Press F2 (Param2).
5. Set SCRUB LENGTH to the desired time, from 25 ms (milliseconds) to 100 ms.
6. Press F6 (EXIT) to confirm your changes.

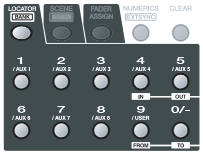
Locators

The VS-2400CD can memorize up to 100 locations in a project, allowing you to jump to any one of them instantly. This makes it easy to quickly get from place to place without having to slow down to hunt for the desired location. Each place you want the VS-2400CD to remember is stored in its memory as a "locator." To jump to that place, recall the locator and the now line instantly moves to its position in the project.

Locators are stored in ten locator banks, numbered from 0-9. Each bank can contain up to 10 locators, also numbered 0-9. You can also name each locator to help remind you where in the project it'll take you—see "Editing Locators" on Page 180.

It's best to use locators to store the locations of sections of your project, as opposed to the locations of individual audio events. Since locators are so easy to recall, they're great for getting around. For places you want to bookmark but don't plan to visit often, use markers (Page 182)—you can have up to 1,000 markers in project.

Basic Locator Operations



The following operations take place when the LOCATOR indicator is lit to signify you're in Locator mode.

You can use the Locator feature's Safe mode to perform locator operations more carefully from list in a LOCATOR window. See Page 181.

Storing a Locator

You can store locator's while a project's playing or when it's stopped.

1. Press LOCATOR•BANK if it's not already lit.
   Each locator bank contains 10 memory slots, numbered from 0-9, in which a locator can be stored. These memory slots correspond to the 0-9 buttons on the numeric keypad. When a locator's been stored in a slot, its button lights on the keypad.
2. Press any 0-9 button on the keypad to store the locator in the corresponding memory slot. If you'd like to store the locator in a different locator bank, see "Changing Locator Banks" and press the desired button in the selected bank.
3. If a memory slot already contains a locator, and you want to store a new locator there, you'll have to first clear the older locator. See "Clearing a Locator" below.

Recalling a Locator

1. Press LOCATOR if it's not already lit.
2. If the currently selected locator bank contains the locator you want, press the locator's lit button on the keypad. To recall a locator from another bank, follow the instructions in "Changing Locator Banks" and press its button in the selected bank.

Changing Locator Banks

1. Press LOCATOR if it's not already lit. If any locators are stored in the currently selected locator bank, their buttons light on the numeric keypad.
2. While holding down SHIFT, press LOCATOR•BANK. The button for the currently selected bank lights solidly, and the other keypad buttons flash.
3. Press 0-9 to select the desired locator bank—if locators are stored there, their numbers light on the keypad.

Clearing a Locator

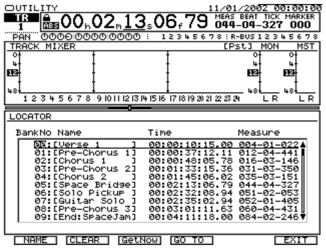
1. Press LOCATOR if it's not already lit. If you'd like to clear a locator from a different bank, see the instructions in "Changing Locator Banks" first.
2. While holding down CLEAR, press the desired locator's button on the keypad. The locator is cleared from that memory slot, and the button's light turns off.

Other Locator Operations

Editing Locators

You can edit locators on the UTILITY menu's LOCATE screen. You can name them, clear them, create them, change their positions and jump to them from this screen.

1. Hold down SHIFT and press F4•UTILITY.
2. Press PAGE repeatedly until "LOCATE" appears over F5.
3. Press F5 (LOCATE).



BankNo	Name	Time	Measure
00:	[Verse 1]	00:00:10:15.00	004-01-022
01:	[Pre-Chorus 1]	00:00:37:12.11	012-04-441
02:	[Chorus 1]	00:00:48:05.78	016-03-146
03:	[Pre-Chorus 2]	00:01:33:15.36	031-03-350
04:	[Chorus 2]	00:01:45:06.02	035-03-151
05:	[Space Bridge]	00:02:13:06.79	044-04-327
06:	[Solo Pickup]	00:02:32:08.94	051-02-053
07:	[Guitar Solo]	00:02:35:02.94	052-01-405
08:	[Pre-chorus 3]	00:03:01:11.63	060-04-431
09:	[End:SpaceJam]	00:04:11:18.00	084-02-246

4. Press ▲ or ▼ or turn the Time/Value dial to select the desired locator. You can:
   - press F1 (NAME) to rename (Page 71) the selected locator.
   - press F2 (CLEAR) to delete the selected locator.
   - press F3 (GetNow) to reset the locator to the now line's current position.

You can store a new locator at the now line's current position by scrolling to an unused locator line and pressing F3 (GetNow).

   - Press F4 (GO TO) to move the now line to the selected locator's position.
5. Press F6 (EXIT) when you're done to confirm your changes.

Switching Automatically to Locator Mode

You can set the VS-2400CD so that it remains in Scene mode after recalling and storing scenes, or so it automatically returns to Locator mode after either action.

1. Hold down SHIFT and press F4•UTILITY.
2. If you don't see "GLOBAL" above F2, press PAGE until you do.
3. Press F2 (GLOBAL).
4. If F1 (Param1) isn't highlighted, press F1 (Param1).
5. You can set the RETURN TO LOCATE Sw parameter to:
   - *On*—to automatically return to Locate mode after you store or recall a scene.
   - *Off*—so that you return to Locate mode by manually pressing LOCATE.
6. Press F6 (EXIT) to confirm your changes.

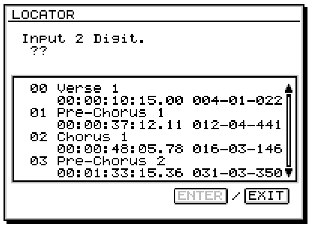
Locators in Safe Mode

If you prefer to work with locators a bit more slowly and carefully, you can use Safe mode. Safe mode allows you to work with locators in a LOCATOR window that shows each locator's number and name. You can also store and clear locators in Safe mode. While this is a slower way to work, it provides greater certainty that you've got the right locator.

Turning on Locator Safe Mode

1. Hold down SHIFT and press F4•UTILITY.
2. If "GLOBAL" doesn't appear above F2, press PAGE until it does.
3. Press F2 (GLOBAL).
4. The UTILITY menu's LOCATOR/SCENE TYPE parameter turns Safe mode on or off—see Page 356. Its default value is Quick. To turn on Safe mode, select Safe.

Recalling a Locator in Safe Mode

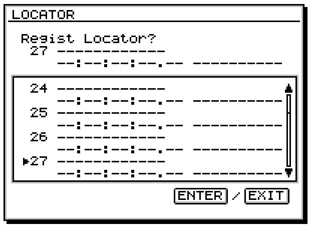


```
LOCATOR
  Input 2 Digit.
   ??

  00 Verse 1
     00:00:10:15.00 004-01-022
  01 Pre-Chorus 1
     00:00:37:12.11 012-04-441
  02 Chorus 1
     00:00:48:05.78 016-03-146
  03 Pre-Chorus 2
     00:01:33:15.36 031-03-350
```

1. Press LOCATOR—the LOCATOR window opens.
2. Turn the Time/Value dial to scroll through the list until the desired locator is in view.
3. Enter the locator's two-digit number on the keypad—an arrow appears to the left of the locator in the list, and "Locate? appears in the window.
4. Press ENTER/YES to recall the selected locator and close the window, or just press ENTER/NO twice to leave the window without recalling a locator.

Storing a Locator in Safe Mode



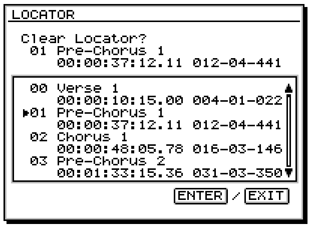
```
LOCATOR

 Regist Locator?
  27 -------------
     --:--:--:--.-- ----------

  24 -------------
     --:--:--:--.-- ----------
  25 -------------
     --:--:--:--.-- ----------
  26 -------------
     --:--:--:--.-- ----------
 ▸27 -------------
     --:--:--:--.-- ----------
```

1. Position the now line at the desired location on the project.
2. Press LOCATOR—the LOCATOR window appears.
3. Turn the Time/Value dial to scroll through the list until the desired unused locator slot is visible.
4. Enter the slot's two-digit number on the numeric keypad—an arrow appears to the left of the slot in the list and "Regist Locator?" appears in the window.
5. Press ENTER/YES to store the now line's current position as a new locator and close the window, or just press EXIT/NO twice to leave the window without registering the locator.

Clearing a Locator in Safe Mode



```
LOCATOR

 Clear Locator?
  01 Pre-Chorus 1
     00:00:37:12.11 012-04-441

  00 Verse 1
     00:00:10:15.00 004-01-022
 ▸01 Pre-Chorus 1
     00:00:37:12.11 012-04-441
  02 Chorus 1
     00:00:48:05.78 016-03-146
  03 Pre-Chorus 2
     00:01:33:15.36 031-03-350
```

1. Press LOCATOR—the LOCATOR window appears.
2. Turn the Time/Value dial to scroll through the list until the desired locator is visible.
3. Enter the locator's two-digit number on the numeric keypad—an arrow appears to the left of the locator in the list.
4. Press CLEAR—"Clear Locator?" appears.
5. Press ENTER/YES to clear the selected locator and close the window, or just press EXIT/NO three times to leave the window without clearing the locator.

Markers

You can bookmark up to 1,000 locations in a project using markers. Markers are a great way to keep track of key moments in a project. You can use them to tag edit points you've located using the Preview (Page 177) or Scrub (Page 178) features. You can also use them to re-order the sections of a project using the Region Arrange feature. Markers can be named and manually edited.

You can see the last marker the now line passed in the current time location display. If there are no markers in the project, the marker area of the display (Page 122) shows "—." If the now line hasn't yet reached the first of the project's makers, you see "***."

We recommend using markers to tag the locations of individual project events, and using locators (Page 179) to memorize where your project's sections are since you can recall locators more quickly than markers. And with 1,000 markers, you won't use them all up as quickly as the 100 locators in a project.

When you create an audio CD on the VS-2400CD (Chapter 26), you'll place special CD track markers to identify the selections on the CD.

Placing a Marker

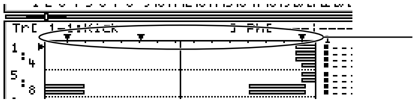
You can place a marker when the project is stopped or when it's playing.

There must be at least 0.1 seconds of time between any two markers.

To Place a Marker

TAP
SNAPSHOT

1. Press TAP to place a marker at the now line's current location. The marker appears as a downward-pointing arrow above the home screen's playlist in the location at which you hit TAP.



We've placed three markers, as shown by the arrows above the playlist.

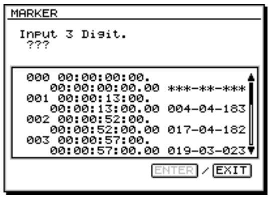
How Marker Numbers are Assigned

When a marker is placed, it's assigned a number—this number serves as the marker's name unless you manually edit it (Page 184). A marker's number reflects its position in a chronological list of all of the markers in a project. If new markers are placed in the project, any markers that follow them are renumbered to reflect their new, later position in the marker list.

Moving the Now Line to a Marker

Using the Locate to Marker Window

You can jump to any marker's position in the project at any time.

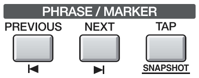


```
MARKER
 Input 3 Digit.
  ???
 000 00:00:00:00.
     00:00:00:00.00 ***-**-***
 001 00:00:13:00.
     00:00:13:00.00 004-04-183
 002 00:00:52:00.
     00:00:52:00.00 017-04-182
 003 00:00:57:00.
     00:00:57:00.00 019-03-023
```

1. Hold down SHIFT and press F6•MARKER—the Locate to Marker window appears.
2. Turn the Time/Value dial to place an arrow to the left of the desired marker—ENTER/YES turns on.
3. Press ENTER/YES to jump to the marker's location.
4. Press EXIT/NO to close the window.

You can also clear a marker from the Clear Marker window, as described on Page 184.

Using PREVIOUS and NEXT



You can jump from one marker to the next, or back using the PREVIOUS and NEXT buttons:

SHIFT
+
PREVIOUS

- *Hold down SHIFT and press NEXT*—to jump to the next marker in the project after the now line's current position.
- *Hold down SHIFT and press PREVIOUS*—to jump to the last marker in the project before the now line's current position.

You can change the behavior of the PREVIOUS and NEXT buttons so you don't have to hold SHIFT. As shipped from the factory, they're set to move from phrase to phrase on the selected track (Page 236). To change the buttons' behavior, switch the PREVIOUS/NEXT Sw Utility menu parameter (Page 356) to MARKER.

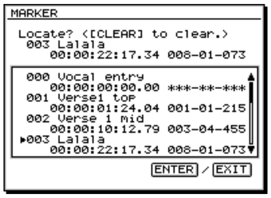
Clearing Markers

In addition to the two methods listed here, you can clear a marker in the UTILITY menu’s Marker screen, described in “Editing Markers” below.

Clearing a Marker Using PREVIOUS and NEXT

1. Move to the marker you want to clear using PREVIOUS or NEXT (see above).
2. Hold down CLEAR and press TAP.

Clearing a Marker in the Clear Marker Window



```
MARKER
 Locate? <[CLEAR] to clear.>
  003 Lalala
     00:00:22:17.34 008-01-073

  000 Vocal entry
     00:00:00:00.00 ***-**-***
  001 Verse1 top
     00:00:01:24.04 001-01-215
  002 Verse 1 mid
     00:00:10:12.79 003-04-455
 ▸003 Lalala
     00:00:22:17.34 008-01-073
```

1. Hold down SHIFT and press F6•MARKER—the Locate to Marker window appears.
2. Turn the Time/Value dial to place an arrow to the left of the desired marker.
3. Press CLEAR—the Clear Marker window appears.
4. Turn the Time/Value dial to select another marker if you want to.
5. Press ENTER/YES to clear the selected marker.
6. Press EXIT/NO to leave the Clear Marker window.
7. Press EXIT/NO to close the Locate to Marker window.

Clearing All Markers at Once

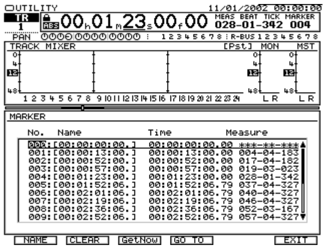
When you clear all markers, every marker in the project is deleted, including all CD track markers.

1. Hold down SHIFT and CLEAR and press TAP. The VS-2400CD asks if you’re sure you want to delete all of the project’s markers.
2. Press ENTER/YES to clear all of the project’s markers, or EXIT/NO to cancel the operation.

Editing Markers

The UTILITY menu’s Marker screen provides tools for naming, clearing, resetting or jumping to any marker.

1. Hold down SHIFT and press F4•UTILITY.
2. Press PAGE until “MARKER” appears above F4.
3. Press F4 (MARKER).



```
No.  Name                 Time            Measure
000:[00:00:00:00.]   00:00:00:00.00  ***-**-***
001:[00:00:13:00.]   00:00:13:00.00  004-04-183
002:[00:00:52:00.]   00:00:52:00.00  017-04-182
003:[00:00:57:00.]   00:00:57:00.00  019-03-023
004:[00:01:23:00.]   00:01:23:00.00  028-01-342
005:[00:01:52:06.]   00:01:52:06.79  037-04-327
006:[00:02:01:06.]   00:02:01:06.79  040-04-327
007:[00:02:19:06.]   00:02:19:06.79  046-04-327
008:[00:02:36:06.]   00:02:36:06.79  052-03-167
009:[00:02:52:06.]   00:02:52:06.79  057-04-327
```

4. Press ▲ or ▼ or turn the Time/Value dial to select a marker to edit. You can:
   - Press F1 (NAME) to rename (Page 71) the selected marker.
   - Press F2 (CLEAR) to delete the selected marker.
   - Press F3 (GetNow) to reset the marker to the now line’s current position.
   - Press F4 (GO TO) to move the now line to the selected marker’s position.
5. Press F6 (EXIT) when you’re done to confirm your changes.

Punching

You can re-record any section of an already recorded track using a process called "punching."The process actually has three stages, each with its own name:

- When you start the re-recording, you "punch in."
- The re-recording act itself is called the "punch."
- When you end the re-recording, you're "punching out."

On the VS-2400CD, you can punch manually, or you can pre-set the places in the project where you'll punch in and out using the Auto Punch feature. Auto-punching is great for hands-free punching when you're recording yourself.

The VS-2400CD punches in and out quite quickly, so you can punch even very small pieces of a track if you're fast enough. If you're not, use Auto Punch.

Ideally, punching should be inaudible to the listener—the result should sound like one continuous performance rather than a collection of bits and pieces. The VS-2400CD's PHRASE LEVEL parameter lets you to adjust the level of individual phrases to smooth out any volume changes that occur where you've punched in and out. See Page 258.

Monitoring During Punching

When you're punching on a track somewhere other than at the very start of the project, you'll typically begin playback just before the section you want to re-record. This lets you get oriented before recording actually starts. However, you may want to hear either of two things on the track as you wait for the punch. Would you (or your performers) prefer to hear the already recorded track or the live input signal?

- If you listen to what's already on the track, you'll be able to hear where you are, but you won't really be able to warm up or rehearse because you won't hear yourself.
- If you choose instead to listen to the live input signal, you won't be able to hear the recording, and may not know exactly where to come in for the punch.

You can hear either the already recorded audio *or* the live input signal, which is called the "source signal" in this context.

- When the project is stopped—so it's neither recording or playing back—you'll hear the source signal.
- The RECORD MONITOR parameter on the UTILITY PlayRec screen (Page 358) determines what you'll hear before, during and after a punch. If it's set to:
  - *Auto*—you'll hear the recorded track before the punch and the source signal as you record. After you punch-out, you'll hear the recorded track.
  - *Source*—you'll hear the source signal before, during and after the punch.

Before You Punch

When you're re-recording a portion of a track you've just recorded, you don't have to do anything to prepare your signal for punching. If you're punching on a track recorded at an earlier time, do your best to match the original recording's sound and level.

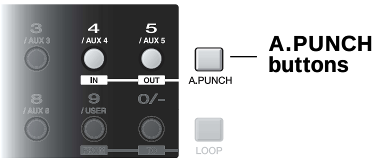
Decide how you want to monitor the punch as described above, listening before the punch to the already-recorded audio or to your source signal.

Punching In and Out Manually

If you want to punch something quickly without stopping to set up an auto-punch—and you've got a hand free—you can punch in and out using the transport buttons.

1. Hold down REC and press the track's TRACK STATUS button so that it's flashing red to arm the track for recording.
2. Move to a location in the project shortly before the spot where you want to punch in—pick a place that lets you get your bearings before the punch-in occurs.
3. Press PLAY.
4. When you reach the place at which you want recording to start, press REC—recording begins and the REC button lights solid red.
5. To punch out, press REC again when you reach the point at which you want recording to end.

Auto-Punching



The VS-2400CD's Auto Punch feature automatically punches in and out at specified locations in the project. When you use Auto Punch:

- You don't have to bother with manually punching in and out and can concentrate on what's being recorded
- If you're recording yourself, you can punch hands-free.
- If you'll be needing to do the same punch over and over until the recorded performance is just right, Auto Punch ensures that each attempt will occur at precisely the same location as the last.

You can use Auto Punch together with looped playback (Page 174) to automatically record multiple takes of the same section as a performance is perfected. Set the loop so that it starts a measure or two before the punch, and ends a measure or two after it so that the section plays over and over in a musically sensible way. Make sure LOOP and A.PUNCH are lit during punching. You can retrieve past takes recorded with this method using the Take Manager and New Phrase features, described in Chapter 19.

An auto-punch begins with the placement of Auto Punch IN and OUT points that tell the VS-2400CD where you want to punch in and where you want to punch out. There are a few ways different ways you can set these—use whichever method you prefer.

You can manually edit the Auto Punch IN and OUT point locations to make their placement more precise. See Page 187.

Setting Auto Punch Points When a Project Isn't Playing

1. Move the now line to the desired punch-in location.
2. Hold down A.PUNCH and press IN.
3. Move the now line to the desired punch-out location.
4. Hold down A.PUNCH and press OUT.
5. If you need to re-set either point, move the now line to the desired location, hold down A.PUNCH and press the IN or OUT button. You can repeat this as many times as necessary.

Setting Auto Punch Points While a Project Is Playing

1. Start playback shortly before the location at which you want the punch to begin.
2. Hold down A.PUNCH.
3. Without releasing A.PUNCH, press TAP at the desired punch-in point.
4. Continue holding A.PUNCH and press TAP at the desired punch-out location.
5. Release A.PUNCH.

Clearing Auto Punch Points

1. Hold down A.PUNCH.
2. Without releasing A.PUNCH, hold down CLEAR and press IN or OUT.
3. Release A.PUNCH.

Setting Auto Punch Points Using Locators

You can learn about locators on Page 179. The following steps presume you've already placed locators at the desired punch-in and -out locations.

1. Press LOCATOR—so it's lit—and select the locator bank containing the locators you want to use as punch-in and punch-out points.
2. Press the locator positioned at the start of the section you want to punch.
3. Hold down A.PUNCH and press IN.
4. Press the locator positioned at the end of the section you want to punch.
5. Hold down A.PUNCH and press OUT.

Setting Auto Punch Points Using Markers

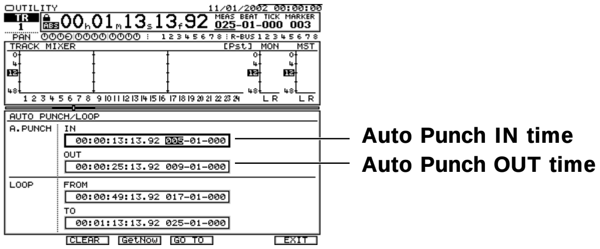
Markers are described on Page 182. Before setting your Auto Punch In and OUT points, place markers at the desired punch-in and -out locations.

1. Move to the marker located at the desired punch-in location.
2. Hold down A.PUNCH and press IN.
3. Move to the marker positioned at the end of the section you want to punch.
4. Hold down A.PUNCH and press OUT.

Editing Auto Punch IN and OUT Points Manually

You can edit, clear and place Auto Punch IN and OUT points on the AUTO PUNCH/ LOOP screen in the UTILITY MENU.

1. Hold down SHIFT and press A.PUNCH to view the AUTO PUNCH/LOOP screen.


UTILITY 11/01/2002 00:00:00
TR 1 ABS 00h01m13s13f92 MEAS BEAT TICK MARKER 025-01-000 003
AUTO PUNCH/LOOP
A.PUNCH IN 00:00:13:13.92 005-01-000
OUT 00:00:25:13.92 009-01-000
LOOP FROM 00:00:49:13.92 017-01-000
TO 00:01:13:13.92 025-01-000

You can do a few things with your Auto Punch IN and OUT points on this screen:

- You can use the cursor buttons and Time/Value dial, or your mouse, to change either point's location by time code or measures and beats.
- You can select IN or OUT on the screen and press F2 (CLEAR) to erase its current time assignment.

- You can grab the now line's current position as a new IN or OUT point. Select IN or OUT on the screen and click F3 (GetNow).
- You can move the now line to an IN or OUT location by selecting IN or OUT on the screen and clicking F4 (GO TO).

2. Press EXIT when you're done to confirm your changes.

Performing an Auto Punch

1. Set your Auto Punch IN and OUT points as described above.
2. Press A.PUNCH so it's lit.
3. Move to a convenient location in the project before the location you want to punch.
4. Press the track's TRACK STATUS button so it flashes red.
5. Press REC so it flashes red.
6. Press PLAY.
   When the now line reaches the punch-in point recording automatically begins and the TRACK STATUS and REC buttons light solidly red. When the now line gets to the punch-out point, recording automatically stops and the TRACK STATUS and REC buttons resume flashing.
7. To turn Auto Punch off, press A.PUNCH so it's not lit.

14—Working with Track Channels

The VS-2400CD's track channels control the sound of its hard disk recorder's tracks. When you're recording a track, you listen to its source signal through the corresponding track channel to ensure you're hearing what the hard disk recorder is capturing. When you play back a track, you play it through its track channel.

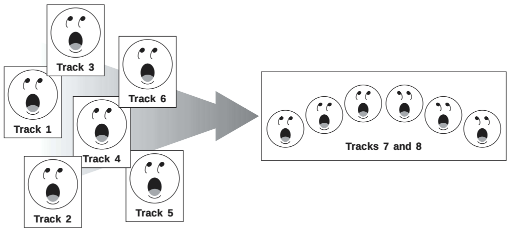
To learn how to:

- select a V-Track for playback, see Page 119 and Page 147.
- shape a track's sound, see Chapter 11, starting on Page 145.
- add effects to the track's sound, see Page 207.

In this chapter, we'll discuss a few things you might want to do with recorded tracks. We'll discuss bouncing. We'll explain how to route a track channel to a Direct path. We'll also provide some guidance on how to prepare your recorded tracks for a final mix.

You might also want to send recorded tracks directly to the VS-2400CD outputs and on to external devices. This topic is discussed on Page 274.

Bouncing



"Bouncing" is the process of submixing one or more already recorded tracks and recording that submix onto a new track or a new pair of tracks. There are many reasons to bounce:

- You bounce when you record your final mix onto your mastering tracks (Page 330).
- You might want to combine a group of related tracks—such as a large set of individually recorded background vocals, or a couple of instruments whose textures you're combining—so that you can work with them as a single object when you create the final mix.
- You can make your available effects processing power go farther by bouncing tracks with their intended effects. Once the tracks and effects have been bounced, you'll be free to use the effect processors for other jobs in the final mix.
- You might want to create an different-sounding version of a track.
- You can compile the best parts of multiple tracks into a single great one by bouncing their best pieces together.

When you bounce, you copy the bounced tracks, so the original tracks remain safe and sound unless you manually erase them. You can return to the original tracks if you need to do the bounce again or to do some editing or re-recording of the original material.

Though we refer to "bouncing *tracks*" for simplicity's sake, what you're really doing when you bounce is bouncing V-Tracks.

While the following sections describe performing a single bounce, you can use the same methods to perform multiple, separate bounces simultaneously to save time.

The Mechanics of Bouncing

For most of the things you do with tracks in the VS-2400CD, you can think of a track in the hard disk recorder and its corresponding track channel as pretty much the same thing—the track plays through its track channel, which provides the parameters that determine how the track will play and sound.

In bouncing, however, it's important to remember the difference between the two so you remain clear about what you're doing. When you bounce, here's what happens:

- The hard disk recorder plays one or more tracks through their track channels. We'll call these the "source track channels."
- You send the output of the source track channels to a new track, or pair of linked tracks, on the hard disk recorder we'll call the "destination track or linked tracks."
- You monitor the destination track or linked tracks through their own track channels during recording and playback—each of these is a "destination track channel."
- You record the bounce onto the destination track or linked tracks.

Mono and Stereo Bouncing

You can bounce anything you've recorded, including single mono tracks or linked tracks that contain stereo recordings. You can also bounce in mono or stereo:

- *To perform a mono bounce*—bounce to a single, unlinked track.
- *To perform a stereo bounce*—bounce to a pair of linked tracks (Page 147).

If your tracks are stereo but you bounce in mono, the stereo audio on the original tracks is combined into mono during the bounce.

Think about your final mix to decide if you should bounce in mono or stereo:

- If you're combining multiple single-track instruments that'll be positioned in the same place in the final stereo mix, bounce them in mono.
- If you're bouncing stereo instruments that'll be positioned together in the mix, bounce in stereo to retain their stereo imaging.
- If you want the bounced tracks to be heard in different left/right locations in the final mix, bounce in stereo and position them as desired in the bounce.
- If you're bouncing a single-track instrument to add a mono effect, bounce in mono.
- If you're bouncing one or more single-track instruments to add a stereo effect, bounce in stereo.
- If you're compiling bits and pieces of a mono performance, bounce in mono; if it's a stereo performance—of a pianist or a horn section, for example—bounce in stereo.

First Things First

In order to ensure success, perform the bounce in the following order:

1. If you want to perform a stereo bounce, link the pair of tracks you'll be bouncing to.
2. Route the source track channels to the destination track or linked tracks.
3. Set up your monitoring so that you're listening to the destination track channel(s).
4. Create a submix of the source track channels. If you want to add effects, route them to the destination track or linked tracks (see Chapter 16).
5. Perform the bounce.

Link the Destination Tracks For a Stereo Bounce

To link the adjacent odd/even tracks on which you'll be recording a stereo bounce:

1. Press the FADER button that selects the group of track channels containing those that correspond to the desired destination tracks, and then:
    - Press either destination track channel's CH EDIT button and turn ChLink on.
    - Hold down one destination track channel's CH EDIT button and press the other destination channel's CH EDIT button.

Routing Tracks for a Bounce

To set up track bouncing, you can use any of three methods:

- You can use Quick Routing—see below. (For Quick Routing basics, see Page 166.)
- You can use the EZ ROUTING VIEW screen, described on Page 192.
- You can also use a destination track's ASSIGN screen, described on Page 161.

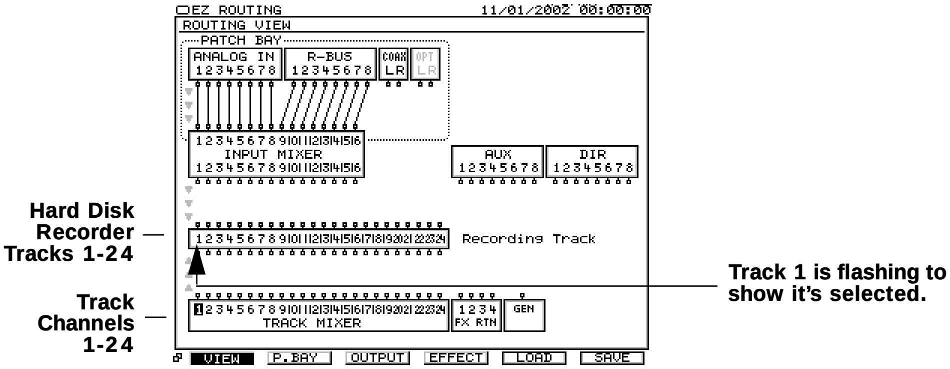
Each pair of stereo linked track channels or hard disk recorder tracks appears as a single stereo object with a single virtual connection wire during routing. Therefore, when the following sections describe the bouncing of mono source track channels to mono destination tracks, the steps apply equally to linked source track channels and linked destination tracks—they act just like their unlinked counterparts when you're setting up routing.

You can also include input channels, Aux and Direct paths and FX return channels in a bounce. When you bounce tracks and live input signals, it's called a "live bounce."

You can save any routing you create as an EZ Routing template. See Chapter 22 to learn about EZ Routing templates.

Quick-Routing a Bounce

1. Press the FADER button for the group of track channels that contains the channel that corresponds to the desired destination track.
2. Hold down the destination track channel's TRACK STATUS button for a second or so until the QUICK ROUTING screen appears. (If you're bouncing in stereo, hold down either TRACK STATUS button belonging to the destination linked tracks.)


EZ ROUTING
11/01/2002 00:00:00
ROUTING VIEW
PATCH BAY
ANALOG IN 1 2 3 4 5 6 7 8
R-BUS 1 2 3 4 5 6 7 8
COAX LR
OPT LR
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
INPUT MIXER
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
AUX 1 2 3 4 5 6 7 8
DIR 1 2 3 4 5 6 7 8
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
Recording Track
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
TRACK MIXER
1 2 3 4
FX RTN
GEN
VIEW
P.BAY
OUTPUT
EFFECT
LOAD
SAVE

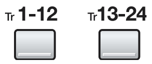
Hard Disk Recorder Tracks 1-24

Track Channels 1-24

Track 1 is flashing to show it's selected.

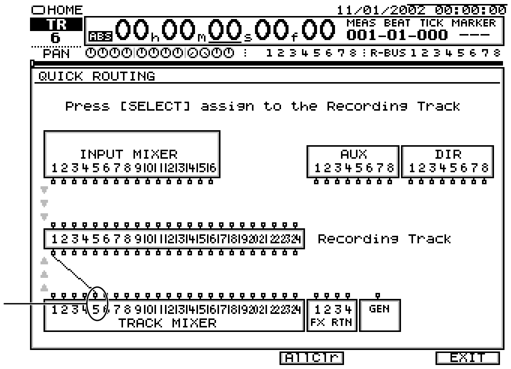
The FADER button you pressed in Step 1 and the TRACK STATUS button you held down in Step 2 light solidly to show the currently selected group of SELECT buttons and the current destination track or linked tracks. If any channels are already routed to the destination track, their SELECT buttons also light solidly.

To clear all of the current connections to a destination track, hold down its TRACK STATUS button and press CLEAR. To quickly clear all of the QUICK ROUTING screen's connections, press F4 (AllClr).



Tr 1-12
Tr 13-24

3. Press the FADER button for the set of track channels that contains a source track channel.
4. Press the source track channel's SELECT button—a virtual wire appears on the screen to show the connection you've made.



HOME
11/01/2002 00:00:00
TR 6
ABS 00h 00m 00s 00f 00
MEAS BEAT TICK MARKER
001-01-000 ---
PAN
1 2 3 4 5 6 7 8 : R-BUS 1 2 3 4 5 6 7 8
QUICK ROUTING
INPUT MIXER
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
AUX
1 2 3 4 5 6 7 8
DIR
1 2 3 4 5 6 7 8
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
Recording Track
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
TRACK MIXER
1 2 3 4
FX RTN
GEN
AllClr
EXIT

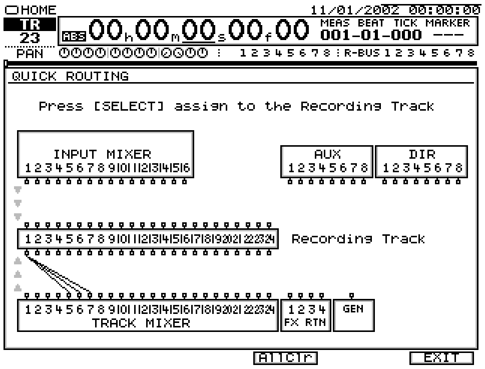
Press [SELECT] assign to the Recording Track

We pressed Track Channel 5's SELECT button

The gray arrows at the left edge of the screen show the direction in which signal flows. When you're bouncing tracks, signal flows up from the track channels to the hard disk recorder tracks.

If you want to break the connection, press SELECT again.

5. Repeat Step 3, if necessary, and Step 4 for any other tracks you want to bounce.



HOME
11/01/2002 00:00:00
TR 23
ABS 00h 00m 00s 00f 00
MEAS BEAT TICK MARKER
001-01-000 ---
PAN
1 2 3 4 5 6 7 8 : R-BUS 1 2 3 4 5 6 7 8
QUICK ROUTING
INPUT MIXER
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
AUX
1 2 3 4 5 6 7 8
DIR
1 2 3 4 5 6 7 8
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
Recording Track
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
TRACK MIXER
1 2 3 4
FX RTN
GEN
AllClr
EXIT

Press [SELECT] assign to the Recording Track

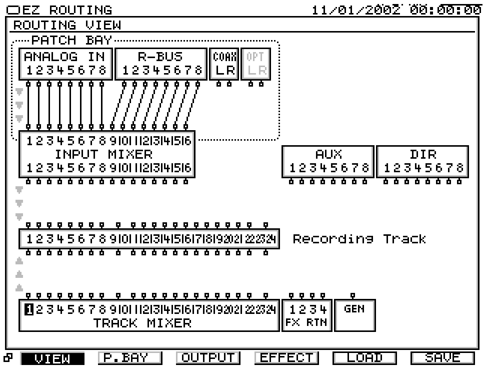
We pressed the SELECT buttons for Track Channels 6 and 7—we're now bouncing Track Channels 5-7 to Track 1 on the hard disk recorder

The gray arrows at the left edge of the screen show the direction in which signal flows. When you're bouncing tracks, signal flows up from the track channels to the hard disk recorder tracks.

6. When you're done, press F6 (EXIT) to confirm the routing and leave Quick Routing.

Setting Up EZ Routing for a Bounce

1. Press EZ ROUTING.



EZ ROUTING
11/01/2002 00:00:00
ROUTING VIEW
PATCH BAY
ANALOG IN
1 2 3 4 5 6 7 8
R-BUS
1 2 3 4 5 6 7 8
COAX
LR
OPT
LR
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
INPUT MIXER
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
AUX
1 2 3 4 5 6 7 8
DIR
1 2 3 4 5 6 7 8
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
Recording Track
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
TRACK MIXER
1 2 3 4
FX RTN
GEN
VIEW
P.BAY
OUTPUT
EFFECT
LOAD
SAVE

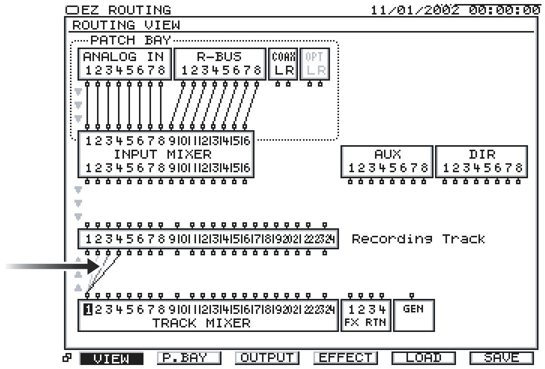
Hard Disk Recorder Tracks 1-24

Track channels 1-24

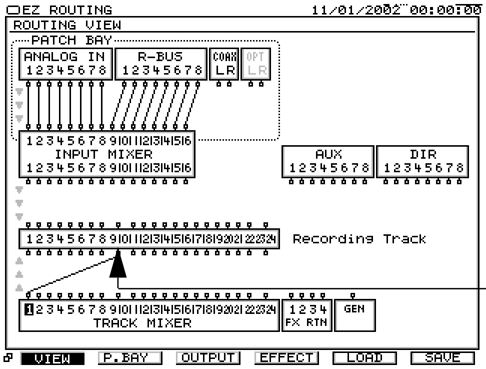
The gray arrows at the left edge of the screen show the direction in which signal flows. When you're bouncing tracks, signal flows up from the track channels to the hard disk recorder tracks.

2. If the ROUTING VIEW screen doesn't appear, and you see "VIEW" above F1, press F1 (VIEW). If you don't see "VIEW" above F1, press PAGE and then F1 (VIEW).

3. Use ◀ , ▶ , ▲ and/or ▼ to select a source track channel's output along the upper edge of the TRACK MIXER block. We've selected Track Channel 1's output in the illustration on the previous page.
4. Turn the Time/Value dial clockwise—as you turn it, a wire appears that connects the track channel to one track after another in the RECORDING TRACKS block.


EZ ROUTING
11/01/2002 00:00:00
ROUTING VIEW
PATCH BAY
ANALOG IN
R-BUS
COAX LR
OPT LR
INPUT MIXER
AUX
DIR
Recording Track
TRACK MIXER
FX RTN
GEN
VIEW
P.BAY
OUTPUT
EFFECT
LOAD
SAVE

5. Turn the dial in either direction to select the desired destination track.

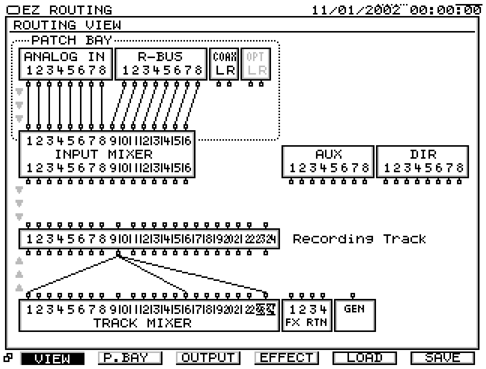

EZ ROUTING
11/01/2002 00:00:00
ROUTING VIEW
PATCH BAY
ANALOG IN
R-BUS
COAX LR
OPT LR
INPUT MIXER
AUX
DIR
Recording Track
TRACK MIXER
FX RTN
GEN
VIEW
P.BAY
OUTPUT
EFFECT
LOAD
SAVE

We've selected linked stereo Tracks 9 and 10 as our destination.

6. To break the connection between a track channel and a track, repeat Steps 3 and 4, and turn the Time/Value dial counter-clockwise until no connection exists.

To clear all track-to-track connections, press PAGE until "ClrTrA" appears above F4, and then press F4 (ClrTrA).

7. Repeat Steps 3-5 to route other track channels' outputs to the destination track.


EZ ROUTING
11/01/2002 00:00:00
ROUTING VIEW
PATCH BAY
ANALOG IN
R-BUS
COAX LR
OPT LR
INPUT MIXER
AUX
DIR
Recording Track
TRACK MIXER
FX RTN
GEN
VIEW
P.BAY
OUTPUT
EFFECT
LOAD
SAVE

We've connected a combination of mono and stereo source track channels to our stereo destination linked tracks.

Source Tracks 1 and 16 are mono track channels, and Track Channels 23 and 24 are linked in stereo.

Listening as You Bounce

When you bounce tracks, it's important to know what you're hearing:

- You don't want to listen directly to the source track channels.
- You *only* want to listen to your destination track channel(s).

By listening only to the destination track channel(s), you can be confident that what you hear is what you'll get in the final recorded bounce. The VS-2400CD helps you monitor a bounce properly by removing the source track channels from the MASTER mix when you arm your destination track or linked tracks for recording.

It's a good idea to bounce while listening to all of the project's other track channels. This'll give you a better idea hear how the bounce will sound in the final mix.

Listening to the Destination Track Channels

Make sure that:

- the CH EDIT MIX parameter for any destination track channel is turned on.
- any destination track channel fader is set to its 0 position. You can adjust the fader's position to make the bounce fit into your mix if you need to.

Set Up the Destination Tracks

Arm the destination track or linked tracks for recording in order to listen to the source track channels through the destination track channel(s) as you mix the bounce.

Record-enable the destination track(s):

1. Hold down REC and press the destination track's TRACK STATUS button so that it flashes red. With linked tracks, press either one's TRACK STATUS button.

Set RECORD MONITOR so you can hear the bounce as you rehearse its mix:

1. Hold down SHIFT and press F4•UTILITY.
2. If "PlyRec" doesn't appear above F4, press PAGE until it does.
3. Press F4 (PlyRec).
4. Set RECORD MONITOR to Source so you can hear what you'll be bouncing as you play the project. (With this parameter set to Auto, you won't hear the bounce as the project's playing until you actually record the bounce.)

You may want to re-set RECORD MONITOR to Auto when you're done bouncing. To learn more about the what RECORD MONITOR parameter does, see Page 185.

Mixing the Bounce

Make sure you've set the TRACK STATUS button for each source track so that it's green, and that you've selected the V-Tracks that contain the audio you want to bounce (Page 147). Likewise, select the V-Track(s) on which you want to record the bounce in the destination track or track pair.

Since you'll be listening to each destination track through its track channel, it's important that you set each destination track channel so that it doesn't color the sound of the bounce. If it does, you may be fooled into making EQ mistakes or other errors as you mix together the tracks you're bouncing. Turn off all EQ, dynamics processing and Aux sends in each destination track channel.

Rehearse the bounce by playing the project a few times, blending together the track channels you're bouncing. Use each source track channel's CH EDIT screens to make any desired changes to its sound. Adjust its EQ or dynamics processing values as needed. If you're bouncing in stereo, pan the source tracks as you want them to be placed in the final mix. Make any changes you want to make while you still have individual control of each track channel's signal—once they're combined in the bounce, they're all locked together. Add any effect you want to use by routing the effect processor's output to the destination tracks, and by sending the desired tracks to the effect using their track channel CH EDIT Aux Send controls (Page 148).

You can use Automix when you bounce. This is handy if you need to make a lot changes to your source track channel settings during the course of the bounce. See Chapter 25.

Setting the Overall Bounce Level

As you blend your source track channels in the bounce, make sure their combined level is suitable for recording. You can do this by keeping your eye on the level meter for the destination track or linked track. You'll find this meter on the Home screen:

1. Press HOME•Display.
2. If necessary, press PAGE until "TR Mix" appears above F3.
3. Press F3 (TR Mix).

Performing the Bounce

Once you've complete the procedures described in the previous section, you're ready to actually perform the bounce. Since your destination track or linked tracks are already armed for recording, all you have to do is:

1. Press ZERO to return to the beginning of the project. If you're only bouncing a section of the project, navigate to a location shortly before that section.
2. Press REC.
3. Press PLAY—the bounce is recorded on the destination track or linked tracks.
4. When the bounce is finished, press STOP.
5. Hold down STOP and press the TRACK STATUS button for the destination track or either TRACK STATUS button for linked destination tracks. The TRACK STATUS button(s) for the destination track or linked tracks turns green.
6. Turn off the TRACK STATUS buttons for the tracks you've bounced so you don't hear them along with the destination track or linked tracks as you listen back.
7. Play back the bounce to make sure it's satisfactory.
8. If you need to perform the bounce again, hold down REC and press the destination track's TRACK STATUS button so that it flashes red. With linked tracks, press either one's TRACK STATUS button. This re-arms the track(s) for recording.
9. Repeat Steps 1-6.

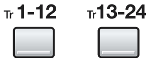
You can punch in and out during bouncing just as you can during any other recording. Punching's described on Page 185.

Don't erase you're original source tracks—that way, you'll be able to redo the bounce at a later time if you need to.

Sending a Track Channel’s Signal to a Direct Path

While you can send a track channel’s signal directly to an output using the track direct outs (Page 274), doing so requires the disabling of all bus connections to your output jacks. If you need to send Aux bus signals to outputs—perhaps for headphone mixes—at the same time as you send your track channel signals there, send each track to an output using a Direct path. To learn more about Direct paths, see Chapter 15.

Routing a Track to a Direct Path



1. Press the desired Tr 1-12 or Tr 13-24 button.
2. Press the desired track channel’s CH EDIT button.
3. Turn on the desired Direct path’s on/off switch (Page 151).

To learn about routing a Direct path to a VS-2400CD output, see Chapter 15.

Mixing

The most important place to send a track channel’s signal is, of course, to the MASTER mix bus when you create your final mix. While a complete discussion of how to mix is far beyond the scope of the *VS-2400CD Owner’s Manual*, here’s a very brief overview of the process to get you started, since track channel signals—the sound of your recorded tracks—are the main ingredient of most VS-2400CD mixes.

Any discussion of mixing has to mention a mix’s other elements: effects and any live input signals you’re using. Discussions of these topics can be found in other chapters.

The Mechanics of Mixing

A final mix is nothing more—or less—than the combining of all of the project’s audio into a single stereo (or Surround) audio signal. That includes your recorded tracks, effects you add to those recordings and any live input signals (such as MIDI instruments) required to complete the project’s sound.

If you’ve connected your VS-2400CD to a pair of Roland DS-90A or DS-50A Digital Reference Monitors, you can try out your mix on a variety of different virtual speakers to make sure your project sounds great wherever it’s played—see “Speaker Modeling” on Page 219.

To create the final mix, send all project elements to the stereo MASTER bus.

- Recorded tracks—are sent to the MASTER mix from their track channels. If you’ve inserted effects on any track channels, they go along for the ride as well.
- Loop effects—are sent to the MASTER mix from the FX return channels.
- Live input signals—are sent to the main mix from the input channels.

Make sure that the CH EDIT MIX parameter (Page 149) for any desired track, FX or input channel is turned on if you want its signal to be sent to the MASTER bus.

Since you listen to the MASTER bus during most VS-2400CD operations, you’re really already mixing as you balance the levels of your track channels just to make things sound good as you work. The final mix may only mean a refinement of what you’ve been listening to all along.

Since track channel EQ and dynamics processing affect only the playback of your tracks—and don't alter their actual recordings—why not experiment with the tracks' sound throughout the recording process? This can give you a great head-start on the final mix.

During the final mix, you'll want to:

- use the track channels' CH EDIT parameters to make each of the project's tracks sound exactly the way you want as you hear them in context with the project's other tracks, effects and so on. Adjust EQ settings, levels, panning and dynamics processing until you're satisfied.
- insert any effects into individual track channels as desired.
- send signals from your track channels to any desired internal loop effects (Page 207), and return the outputs of the effects to the MASTER bus.
- If you're incorporating any live signals, use their input channel CH EDIT parameters to refine their sound. Apply effects to them as needed.

Take advantage of the VS-2400CD's easy-to-use Automix feature. Automix captures changes you make to your tracks' settings as you mix, and plays them back at your command. This lets you build your mix, element-by-element, getting one thing just right, and then another, taking your time as you craft the perfect mix. To learn about Automix, see Chapter 25, starting on Page 313.

Once you've got everything fed into the MASTER bus, and sounding the way you want, the mix can be:

- recorded—bounced—down to a pair of mastering tracks for burning onto an audio CD (see Chapter 26).
- sent to any pair of the VS-2400CD's analog or digital outputs for recording onto an external analog or digital device, respectively.

15—Aux Busses and Direct Paths

The VS-2400CD has two types of multi-use pathways: Aux busses and Direct paths.

- An Aux bus can carry multiple signals to a common destination.
- A Direct path carries a single signal to the selected destination.

The eight Aux busses and the eight Direct paths share a chapter in the *VS-2400CD Owner's Manual* because they serve similar purposes. They can both carry signals to the VS-2400CD's internal effects, to the VS-2400CD's outputs or to hard disk recorder tracks. In this chapter, we'll discuss each type individually and then offer some guidance on how to decide which type of pathway to use in a variety of situations.

It's likely you'll use Aux busses more frequently than Direct paths since Aux busses have more diverse capabilities:

Feature:	*Aux bus:*	*Direct path:*
Carries multiple signals	Yes	No
Receives signal from pre-or post-fader	Yes	Yes
Has individual send level controls	Yes	No
Can be linked in stereo	Yes	No
Master level control	Yes	Yes
Front-panel knob control	Yes	No

However, by taking advantage of your Direct paths, you can leave the Aux busses free for other jobs that only they can perform.

Aux Busses

Aux Bus Overview

The eight Aux busses, or "Aux sends," offer a number of useful capabilities:

- They can carry multiple signals at a time.
- Each input, track and FX return channel has its own Aux send control that lets you set how much of the channel's signal goes to the Aux bus.
- You can send signals to an Aux bus pre- or post-fader.
- You can link odd/even Aux busses to create a stereo Aux bus and pan signals across its stereo field.
- Each Aux bus has its own master fader for setting its overall level.

When Would You Use an Aux Bus?

Aux—for "Auxiliary"—busses are well-named. Since each Aux bus can carry multiple signals, they're useful any time you want to send a group of signals to a common destination. The most common use for an Aux bus in the VS-2400CD is to send signals to one of the VS-2400CD's internal effects. An Aux bus can also carry signals to an external effect for outboard processing, or to a headphone amplifier for your performers (see "Creating a Headphone Mix Using an Aux Bus" on Page 205).

Sending a Signal to an Aux Bus

You can send an input, track or FX return channel's signal to an Aux bus in two ways:

- Each input, track and FX return channel has a set of CH EDIT AUX send controls that let you send a copy of the channel's signal to any of the eight Aux busses. These controls, and how to use them, are described on Page 200.
- In addition, you can send signals from your input, track and FX return channels to a selected Aux bus using the channel faders. See "Activating Fader Control of Aux Send Levels" on Page 136.

You can configure any Aux bus to receive channel signals from before or after a channel's fader level control. See Page 201.

Stereo Aux Busses

The VS-2400CD allows you to link odd/even pairs of Aux busses so each pair acts as a single stereo object. You can send a channel's signal to a pair of linked Aux busses and use a panning control to place the signal's position within the stereo field they create.

This is a great tool when you're using two Aux busses to create a stereo headphone mix for performers—when the busses are linked, you'll have full control of the stereo imaging in the mix (Page 205). It can also be handy when you're sending signals to an internal—or external—effect that has discreet left and right signal paths (see the *VS-2400CD Appendices* for the structures of its internal effects.)

With linking, an Aux bus is linked to the Aux bus next to it. If the Aux bus is:

- *odd-numbered*—it's linked to the even-numbered Aux bus to its right.
- *even-numbered*—it's linked to the odd-numbered Aux bus to its left.

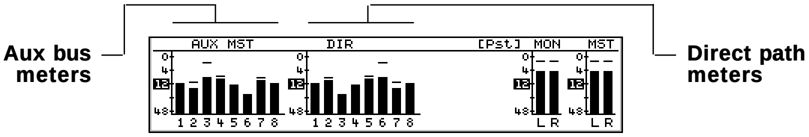
Each Aux bus's configuration determines whether or not it's linked to its odd/even partner. See "Configuring an Aux Bus" on Page 201.

Aux Bus Levels

As with any other signal, you need to make sure that the Aux bus's level isn't too quiet or loud. Rather than having to return to the individual channels' AUX send controls to solve a problem, you can simply adjust the Aux bus's master level fader.

Metering Aux Bus and Direct Path Levels

1. Press HOME•DISPLAY.
2. If "AUXDIR" isn't visible above F4, press PAGE until it is.
3. Press F4 (AUXDIR)—meters for the eight Aux busses appear at the left of the meters display. Just to their right are meters for the eight Direct paths.



Chapter 8 discusses how the Home screen's meters work.

For guidelines on setting Aux bus levels, see "How Do I Get Good Levels?" on Page 58.

Adjusting an Aux Bus's Master Level

1. Press the AUX 1-8/FX 1-4 button so that the first eight channel strips control the Aux master levels.
2. Move a AUX MST 1-8 fader to set the master level of the desired Aux bus.

You can also adjust an Aux bus's master level on its MASTER EDIT screen—see below.

Configuring an Aux Bus

An Aux bus's configuration determines its behavior. You can set an Aux bus so that:

- it receives each channel's signal before its fader ("pre-fader") or after its fader ("post-fader"). To learn about pre- and post-fader Aux sends, see Page 81.
- it's linked to its odd/even partner. See Page 200.

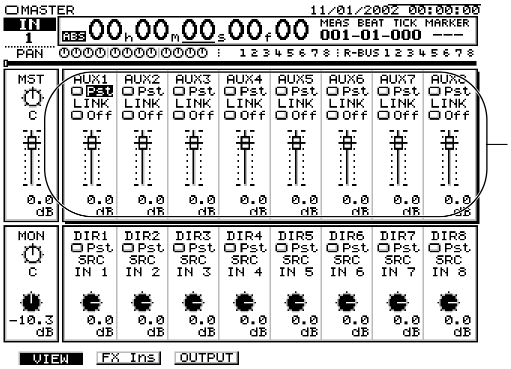
You can configure an Aux bus in either of two places:

- *its MASTER EDIT screen*—allowing you to set up all of your Aux busses at once.
- *a CH EDIT VIEW screen*—letting you quickly configure the Aux bus as you set up a channel's other parameters.

Configuring an Aux Bus from a MASTER EDIT Screen

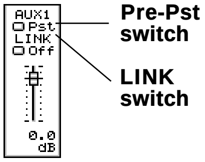
MASTER
EDIT
LCD ↔ VGA

1. Press MASTER EDIT.


MASTER
11/01/2002 00:00:00
IN 1
ABS 00h 00m 00s 00f 00
MEAS BEAT TICK MARKER
001-01-000 ---
PAN
R-BUS
MST
AUX1 AUX2 AUX3 AUX4 AUX5 AUX6 AUX7 AUX8
Pst
LINK
Off
0.0 dB
MON
DIR1 DIR2 DIR3 DIR4 DIR5 DIR6 DIR7 DIR8
SRC
IN 1 IN 2 IN 3 IN 4 IN 5 IN 6 IN 7 IN 8
-10.3 dB
VIEW
FX Ins
OUTPUT

Eight master control strips for the eight Aux busses

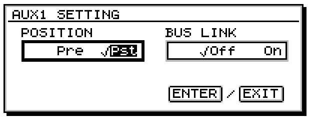
2. Set the Aux bus's Pre/Pst switch to the desired value.
3. To link the bus to its odd/even partner, turn its LINK switch on.


AUX1
Pst
LINK
Off
0.0
dB
Pre-Pst switch
LINK switch

You can adjust the Aux bus's master level by moving the onscreen fader underneath its Pre/Pst and LINK switches—this is the same thing as moving its Aux master channel fader.

Configuring an Aux Bus from a CH EDIT VIEW Screen

1. If you're not already on the CH EDIT VIEW screen for the desired input, track or FX return channel, press the channel's CH EDIT button.
2. Cursor to the desired Aux bus send or click it with your mouse. ENTER/YES starts to flash to show that further options are available.
3. Press ENTER/YES—the following dialog box appears.



AUX1 SETTING
POSITION Pre √Pst
BUS LINK √Off On

4. Select Pre or Pst for the POSITION parameter, as desired.
5. Turn BUS LINK on or off as desired.

When Aux busses are linked, their controls on the CH EDIT screen change—see Page 148 for details.

Direct Paths

Here's what the eight Direct paths can do:

- They can carry a single signal.
- Each input, track and FX return channel has its own Direct path assignment switch that lets you send its signal to any Direct path.
- You can send channel signals to a Direct path pre- or post-fader.
- Each Direct path has a final level control.

When Would You Use a Direct Path?

Wherever you might use an Aux bus to carry a single signal somewhere, you can just as easily use a Direct path—this'll save your Aux busses for other tasks. You can route a Direct path to an internal effect. You can also route it to an output jack (Chapter 21) on its way to an external device such as an external digital recorder, effect processor or computer. You can send the VS-2400CD's metronome output as a click track to a drummer's headphone amp using a Direct path.

Sending Tracks to Outputs

You can route track channels directly to outputs via the track direct outs (Page 274). However, when the track direct outs are active, Aux and Direct path connections to outputs are de-activated. If you need to use these busses to send signals to outputs, send your tracks to the desired outputs using Direct paths instead of track direct outs.

External Insert-Like Effects

While you can't directly insert an external effect into an input, track or FX return channel, you can use a Direct path to accomplish much the same result:

1. Configure a Direct path so that it accepts the channel's signal post-fader (Page 203).
2. Route the Direct path to a digital output—see Chapter 21 for details.
3. Connect the input of the external processor—or a computer with an effect plug-in—to the digital output to which you've routed the Direct out.
4. Assign the desired input, track or FX return channel to the Direct path (Page 151).
5. Turn off the channel's CH EDIT MIX parameter to remove it from the main mix.
6. Return the external processor's—or computer's—output to one of the VS-2400CD's digital inputs. (See Chapter 9.)
7. Select the digital input as the VS-2400CD's master clock (Page 129).
8. Activate the digital input if necessary and route it to an input channel (Chapter 9).
9. Send the input channel's signal into the MASTER mix or to a track (Chapter 12).

Sending a Signal to a Direct Path

Send an input or track channel's signal to a Direct path from the channel's CH EDIT VIEW screen—see Page 151. Page 225 describes sending an effect to a Direct path.

When you send an FX return channel's stereo signal to a Direct path, its left and right sides are mixed together in the mono Direct path.

When you send a channel's signal to a Direct path, it's done using a simple on/off switch. There's no separate send level control for sending the signal to a Direct path.

Direct Path Levels

While each Direct path's level is nominally a carbon copy of the input, track or FX return channel signal it carries, you can adjust the final level of a Direct path on its MASTER EDIT configuration screen, as described in "Configuring a Direct Path" below. This can be helpful if you're sending a channel's signal somewhere else in addition to the Direct path, or to multiple Direct paths.

Metering Direct Path Levels

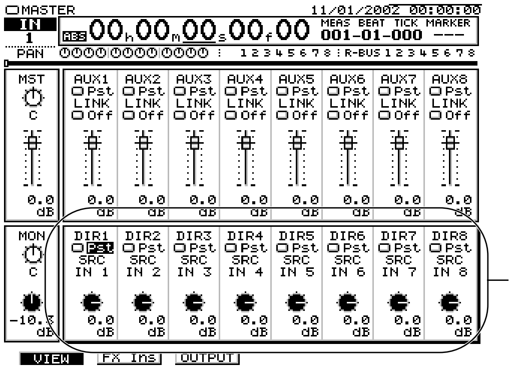
You can see each Direct path's level on in the AUXDIR meters on the VS-2400CD's home page. See Page 200 to learn how to view these meters.

Configuring a Direct Path

Each Direct path can receive signals from an input, track or FX return channel before or after—pre or post—the channel's fader level control. Generally, you'll want to use the post-fader send, though the pre-fader send can be handy when you're using a Direct path for adding an insert-like external effect to a channel's signal (Page 202).

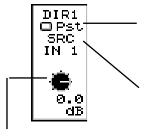
1. Press MASTER EDIT.

MASTER EDIT
LCD ↔ VGA


MASTER
11/01/2002 00:00:00
IN 1
PAN
ABS 00h00m00s00f00
MEAS BEAT TICK MARKER
001-01-000 ---
1 2 3 4 5 6 7 8 : R-BUS 1 2 3 4 5 6 7 8
MST
C
0.0 dB
AUX1 AUX2 AUX3 AUX4 AUX5 AUX6 AUX7 AUX8
Pst
LINK
Off
0.0 dB
MON
C
-10.3 dB
DIR1 DIR2 DIR3 DIR4 DIR5 DIR6 DIR7 DIR8
Pst
SRC
IN 1 IN 2 IN 3 IN 4 IN 5 IN 6 IN 7 IN 8
0.0 dB
VIEW
FX Ins
OUTPUT

Eight master control strips for the eight Direct paths

2. Set the Direct path's Pre/Pst switch to the desired value.
3. Adjust the final level parameter at the bottom of its control strip.


DIR1
Pst
SRC
IN 1
0.0
dB
Pre-Pst switch
SRC channel
Final level control

The SRC readout shows the input or track channel signal currently assigned to the Direct path.

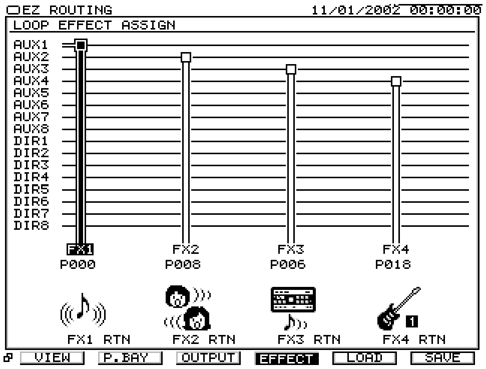
Aux Bus/Direct Path Strategy

Sending Signals to Internal Effects

As shipped from the factory, Aux Busses 1-4 are routed to the VS-2400CD's internal effects so that you can send multiple input, track or FX return channel signals to any internal effect. However, if you just want to send one signal to an effect—thus freeing up an Aux bus—you can send it to the effect on a Direct path.

Routing Aux and Direct Paths to Internal Effects

1. Press EZ ROUTING.
2. If "EFFECT" doesn't appear above F4, press PAGE until it does.
3. Press F4 (EFFECT). The LOOP EFFECT ASSIGN screen appears.


EZ ROUTING
11/01/2002 00:00:00
LOOP EFFECT ASSIGN
AUX1
AUX2
AUX3
AUX4
AUX5
AUX6
AUX7
AUX8
DIR1
DIR2
DIR3
DIR4
DIR5
DIR6
DIR7
DIR8
FX1
P000
FX2
P008
FX3
P006
FX4
P018
1
FX1 RTN
FX2 RTN
FX3 RTN
FX4 RTN
VIEW
P.BAY
OUTPUT
EFFECT
LOAD
SAVE

4. Press ◀ and/or ▶ to select an internal effect.

If the VS8F-2 card required for an effect processor hasn't been installed in your VS-2400CD, the screen shows "No FX Board" for that effect.

5. Turn the Time/Value dial to select the Aux or Direct path you want to use for sending signals to the selected effect.

You can change the factory default assignments of Aux Busses 1-4 to Effects 1-4 if some other arrangement is more convenient for you.

You can route the same Aux or Direct path to multiple effects in order to save busses. While those effects will all have the same input levels, you can adjust each effect's output level to create the desired balance between the effects.

Sending Signals to External Devices

Both Aux and Direct paths can carry signals to the VS-2400CD's outputs on their way to an external device. Here again, any time you're sending a single signal, use a Direct path so as not to use up your more-powerful Aux busses.

Sending Signals to Tracks

If you wish to, you can route Aux and Direct paths directly to VS-2400CD hard disk recorder tracks. With Aux busses, you can use the same Quick Routing method you use for input channel signals (Page 166). You can also use EZ Routing (Chapter 22) to route both Aux and Direct paths to tracks.

Creating a Headphone Mix Using an Aux Bus

Probably the second most common use of an Aux bus—aside from using it to carry signals to an internal effect—is to use the bus to carry input and/or track channel signals to performers' headphones so they can hear what's going on during recording. You can send performers' live input signals along with already recorded tracks to any headphone mix you create.

Since you have eight Aux busses in the VS-2400CD, you can create up to eight separate mono, or four stereo, headphone mixes for your performers.

To temporarily free up all eight Aux busses for use as headphone mix busses, you can use your Direct paths to send individual signals to your effects during recording.

To Set Up an Aux Bus Headphone Mix

The following steps describe how to create a stereo headphone mix. If you want to create a mono mix, skip Steps 1 and 8.

1. Link the odd/even pair of Aux busses you plan to use, as described on Page 201.
2. Set either bus's Pre/Pst switch to Pre—the settings for both Aux busses change. You'll want to use a pre-fader send so that you can adjust your individual channel faders as you record without your performers being distracted by changes you make. Their pre-fader levels will remain constant as you adjust your faders' positions.
3. Route the linked Aux busses to a pair of VS-2400CD outputs connected to the stereo inputs of your external headphone amplifier—Chapter 21 describes output routing.
4. Press the FADER button that selects the group of input or track channels containing the first channel you want to include in the headphone mix.
5. Press the desired input or track channel's CH EDIT button.
6. Turn on the channel's send to the Aux bus by setting its switch to Pre. (See Page 148)
7. Set the amount of signal you want to send to the headphone mix by adjusting the send level to the linked Aux busses you're using.

If you prefer, you can also set your Aux send levels using the faders—see Page 136.

8. Adjust the stereo placement of the channel's signal in the headphone mix.
9. Repeat Steps 4-8 for any other input or track channel signals you want to send to the headphone mix.
10. Press AUX 1-8/FX 1-4.
11. Use the Aux bus's AUX MST 1-8 fader to adjust the headphone mix's overall level.

You can also use effects in the headphone mix. See "Adding Effects to a Headphone Mix" on Page 230.

16—Using Effects

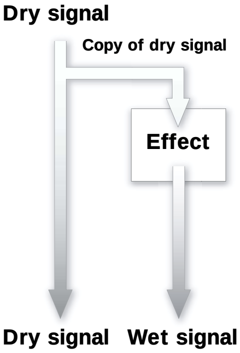
In this chapter, we'll describe how to use the VS-2400CD's effect processing power. We'll detail how to:

- set up a loop effect.
- insert an effect on an input or track channel, or the MASTER bus.
- add effects to a headphone mix.
- select effects.
- edit effects.
- save effects.

For the basics on the VS-2400CD's effects and why they're useful, see Chapters 3 and 5.

Using Loop Effects

When you want to add reverb or a delay to your input, track or FX return signals, use a loop effect. Loop effects add effect processing to a signal—they don't replace it—so that you end up with a combination of the original dry signal and the effect.



The following sections explain how to set up an internal and external loop effect. Whether you're recording a loop effect on tracks or adding them during a mix, the process is the same—the only difference is where you send the effect's output signal when you're done, as described in Chapter 17, "Working with FX Return Channels."

Setting Up an Internal Loop Effect

Play Now, Learn Later

If you've just created a new project and would like to quickly start experimenting with loop effects—and learn about their mechanics later on—you can. When you create a new project that doesn't copy the settings of the currently loaded project (Page 92), the VS-2400CD routes Aux Busses 1-4 to Effects 1-4, respectively. Therefore:

1. Press the FADER button that selects the group of channels containing the input or track channel you want to use.
2. Press the desired channel's CH EDIT button.
3. Use one of the channel's Aux send controls (Page 148) to send some of the channel's signal to the same-numbered effect—use the first set of controls to send the signal to Effect 1, for example. Try a send level of 0.0 dB as a start.
4. Press AUX 1-8/FX 1-4.
5. Adjust the effect's level in the MASTER mix using its FX return channel fader (Page 223).
6. Select the desired effect—see "Selecting Effect Patches" on Page 215.
7. Repeat Steps 1-3 for any other input or track channels you want to send into the effect.

The Mechanics of a Loop Effect

There are six steps to setting up an internal loop effect:

1. Choose one of the internal effect processors as the one you'll use.
2. Route an Aux or Direct path to the selected effect.
3. Configure the Aux or Direct path as desired.
4. Send signals to the Aux bus or Direct path, and, as a result, to the effect.
5. Return the output of the effect to the desired destination.
6. Select and edit—if necessary—the desired effect patch.

Select the desired patch—and edit it, if necessary—as a last step since you won't be able to hear it, and what you're doing, until the previous steps have been performed.

Choose an Effect Processor

As shipped from the factory, the VS-2400CD has two stereo effect processors, Effect 1 and Effect 2. With an optional VS8F-2 installed, Effects 3 and 4 become available. Some algorithms work only with certain processors—see Page 216 for more information.

Route an Aux or Direct Path to the Selected Effect

By default, the VS-2400CD's Aux Busses 1-4 are routed to Effects 1-4, respectively. If you have no particular reason to change this arrangement, you can skip this step.

You can route any Aux bus or Direct path to any effect—Page 204 in Chapter 15 describes how to do this.

Configure the Aux or Direct Path

You'll need to decide whether you want to send signals from your input, track or FX return channels to the Aux or Direct path before or after the channel faders. Unless you're planning an unusual effect whose level stays constant as the dry signal level changes, configure the bus so that it's set to Pre.

You can link odd/even Aux busses to create a stereo send into an effect. Check out the algorithm diagram in the *VS-2400CD Appendices* for the effect you want to use to see if accepts stereo input signals. If it doesn't, use a single unlinked Aux bus. Most VS-2400CD produce stereo effects from a mono input signal.

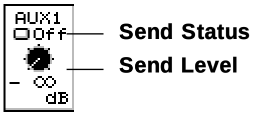
Page 201 describes how to configure an Aux bus. To learn how configure a Direct path, see Page 203.

Send Signals to the Effect

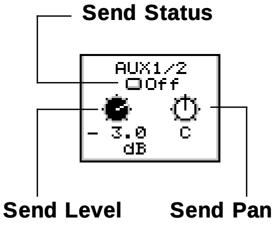
You can send an input, track or FX return channel's signal to an Aux bus using its fader, as described on Page 136—or by using its CH EDIT Aux send controls.

Each input, track and FX return channel provides eight sets of CH EDIT Aux send controls with which you can send the channel's signal to any of the Aux busses. The first four of those Aux control modules send the channel's signal to Aux Busses 1-4, and therefore, to Effects 1-4, respectively.

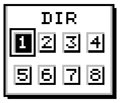
To send a channel's signal to an effect, adjust the Aux send controls for the Aux bus you're using:



1. Select the desired channel and press its CH EDIT button to display its CH EDIT VIEW screen.
2. Turn on the Aux send control's send status switch by setting it to the available Pre or Pst value.
3. Set its send level as desired—use 0.0 dB as a starting value.
4. If you're using linked Aux busses, adjust the Aux send panning control to place the channel's signal in the effect's stereo field.



If you're sending the channel's signal to an effect on a Direct path, turn on the channel's send to the Direct path as described on Page 151.



Return the Output of the Effect

The output of each of the four internal effects has its own channel in the VS-2400CD's digital mixer. These are the four FX return channels, which are the subject of Chapter 17, starting on Page 223. Their faders set their levels, and each has its own CH EDIT parameters with which you can control the sound and destination for the corresponding effect processor.

In a new default project, the four FX return channels are routed into the MASTER mix.

Select an Effect Patch and Edit It if Necessary

We'll explain how to do both of these things in "Selecting Effect Patches" on Page 215 and "Editing Effect Patches" on Page 217.

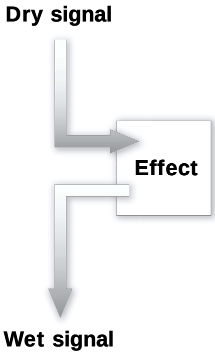
Setting Up an External Loop Effect

You can use an Aux or Direct path to send a signal to an external effect processor. Although the effect is produced by an external device, the usual loop effect send-and-return logic still applies. In fact, a few of the steps are exactly the same:

1. Route an Aux or Direct path to the desired analog output jack or digital output connector—see Page 272 to learn how to assign Aux or Direct paths to outputs.
2. Configure the Aux or Direct path as we've already described on Page 208.
3. Send signals to the Aux bus or Direct path, and, therefore, to the external effect. You can also learn how to do this on Page 208.
4. Return the effect processor's output or outputs to one or two of the VS-2400CD's analog or digital inputs. Chapter 9 describes working with input signals.
5. Route the input signal(s) to one or two input channels. See Chapter 9.
6. Send the input channels' signals to the desired destination as described in Chapter 12.

Inserting an Effect

About Insert Effects



Where They're Used

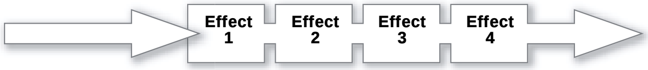
Insert effects can be inserted on individual input and track channels. They can also be inserted on the MASTER bus when you want to run your entire mix through an effect, such as when you're mastering a project's final mix.

It's important to budget your insert effect processing power as you work because an insert effect can only work with one or two signals at a time:

- When you insert an effect on an input or track channel, you can dedicate the whole processor to the channel's signal, or only its left or right side, leaving the other side free for use by another channel.
- If an effect processor is inserted on the MASTER bus, it's unavailable for other use since the MASTER bus's stereo signal always occupies both sides of the processor.

Since each insert effect is injected directly into the channel's signal flow, no Aux or Direct path is required for bringing the channel's signal into the effect.

Insert Effect Chains



If you'd like to use more than one insert effect on a signal, you can chain multiple effects together to create an insert effect chain. With an insert effect chain, a signal flows from one processor to another before resuming its normal signal flow. This can be a great way to immediately take the signal through a series of sonic changes.

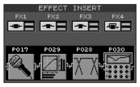
You can chain as many effects together in an insert effect chain as you have available processors. The order of the effects is always the same: Effect 1 first, then Effect 2 and so on. If you use non-consecutive effects in a chain—such as Effect 1 and then Effect 4—the signal still flows through them according to the effect processors' numerical order.

Input and Track Channel Insert Effects

Where Effects are Inserted

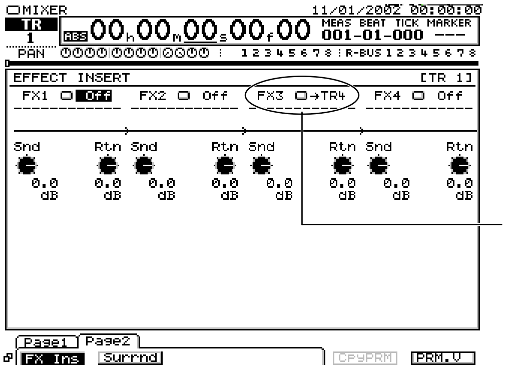
When you insert an effect on an input or track channel, the channel's signal is diverted into the effect just after its dynamics processor. This means that you can perform dynamics processing on a signal before its insert effect, allowing you to shape its volume contour before insert effect processing is applied. The signal exits the insert effect and resumes its normal signal flow through the channel just before the CH EDIT ATT parameter and the channel EQ so you can EQ the effected signal if you wish to.

If you've connected a VGA monitor, each channel's Ch EDIT screen shows the effects inserted on the channel.



Inserting Effects on an Input or Track Channel

1. Select the group of channels that contains the desired input or track channel by pressing its FADER button.
2. Press the desired channel's CH EDIT button.
3. Select the FX INS parameter—the ENTER/YES button begins to flash.
4. Press ENTER/YES, or press PAGE and then F1 (FX Ins), to display the EFFECT INSERT screen.


MIXER
11/01/2002 00:00:00
TR 1
ABS 00h00m00s00f00
MEAS BEAT TICK MARKER
001-01-000 ---
PAN
EFFECT INSERT [TR 1]
FX1 Off
FX2 Off
FX3 →TR4
FX4 Off
Snd
Rtn
0.0 dB
Page1
Page2
FX Ins
Surrnd
CpyPRM
PRM.V

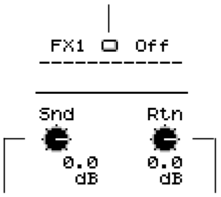
Effect 3 is already inserted on Track Channel 4

If a processor is tied up elsewhere, you'll see an arrow pointing to the input or track channel it's inserted on, as with Effect 3 above. To change this assignment, press CH EDIT for the channel on which it's inserted to access its EFFECT INSERT screen.

Each processor has its own set of insert controls. You can select any available effect processor—depending on the patch you want to use (Page 216)—and insert it on the current input or track channel.

Each of the effect processors is a stereo processor with left and right sides. You can insert both sides of an effect, one or the other, or both sides one-after-another, as explained below.

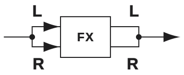
Insert assign switch


FX1 Off
Snd
Rtn
0.0 dB
0.0 dB

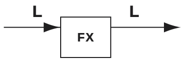
Send level

Return

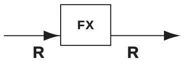
5. Select an effect's insert assign switch and turn the Time/Value dial to select the desired insert routing. You can select OFF, so that the effect isn't inserted on the channel, or you can select:



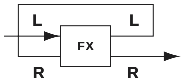
***Ins*—the channel's signal is processed by both sides of the stereo effect.**



***InsL*—the channel's signal is processed by the effect's left side only.**

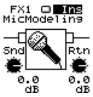


***InsR*—the channel's signal is processed by the effect's right side only.**

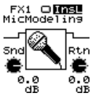


***InsS*—the channel's signal is processed first by the effect's left side, and then by its right side.**

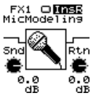
When you select an insert routing, a symbol representing the processor's currently selected effect patch appears to show you the effect you've inserted. Lines in and out of the symbol show the selected signal flow in and out of the inserted effect.


FX1 Ins
MicModeling
Snd
Rtn
0.0 dB
0.0 dB

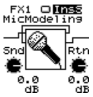
Ins


FX1 InsL
MicModeling
Snd
Rtn
0.0 dB
0.0 dB

InsL


FX1 InsR
MicModeling
Snd
Rtn
0.0 dB
0.0 dB

InsR


FX1 InsS
MicModeling
Snd
Rtn
0.0 dB
0.0 dB

InsS

The INSERT EFFECT section of the VGA's CH EDIT screen—Page 210—also shows the routing of each effect inserted on the channel.

6. You can adjust the level of the signal going into the insert effect using the effect's Snd control. You can also adjust the Rtn level of the signal as it leaves the effect. With a single insert effect, you'll typically adjust these settings only if there's a problem with the sound of the effect.
7. If you're constructing an insert effect chain, repeat Steps 5 and 6 for each desired insert effect.

The Snd and Rtn levels become more important when you're using more than one insert effect, since multiple insert effects do more to affect the signal's level. If any effect in the chain sounds distorted, lower the effect's Snd level or the Rtn level of the preceding effect. The Rtn setting for the very last insert effect in the chain sets the final volume of the signal as it resumes its normal signal flow through the channel.

8. Once you've set up your insert effects, select the desired effect patch for each—see "Selecting Effect Patches" on Page 215.

Insert Routing Tips

Here are some tips to help you choose the most suitable of the four possible insert routings—Ins, InsL, InsR and InsS—for your input or track channel signal. In general, the type of routing you should select depends on the effect patch you'll be using. Specifically, it depends on how the patch's algorithm treats its left and right sides. Refer to the algorithm diagrams in the *VS-2400CD Appendices* to see how each algorithm works.

The Ins Routing

Many of the VS-2400CD's effect algorithms combine their left and right inputs into a single signal for processing. The Ins routing is therefore an excellent candidate for effect patches based on these algorithms. You can insert the left and right side of these effects on different channels, but since both sides will end up being processed as single sound, there's not much point in doing so.

The InsL and InsR Routings

When an effect patch's algorithm processes its left and right sides independently, you can treat the processor as if it's two mono processors rather than a single stereo processor. You can insert each side of the processor on different channels using the InsL or InsR insert routing. A number of the VS-2400CD's algorithms are designed for this kind of use.

The InsS Routing

The InsS routing sends the channel's signal into and out of the left side of an effect, and then into the right side. When you use this routing with an effect patch whose algorithm treats the left and right sides independently, you essentially double the effect's power. For example, if you use InsS with an effect that uses the Parametric Equalizer ("PEQ") algorithm, the signal goes through its four-band EQ on the left, and then the four-band EQ on its right, turning the algorithm into an eight-band equalizer.

MASTER Bus Insert Effects

Where Effects are Inserted

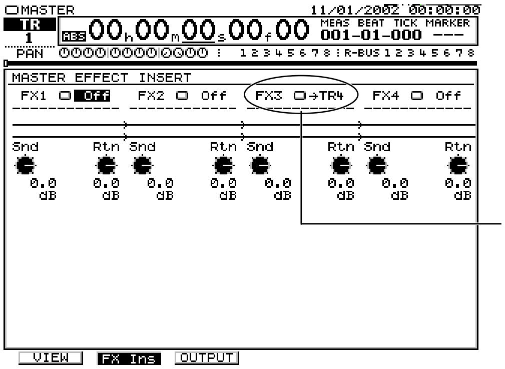
MASTER bus insert effects are inserted onto the MASTER bus just before its final level control—the MASTER fader. Use an insert effect on the MASTER bus if an entire mix needs a particular type of processing.

When you master your final mix in preparation for burning an audio CD or for transfer to a computer or other external digital audio device, you can apply an insert effect to the whole mix from within the VS-2400CD's Mastering Room. The VS-2400CD offers a large collection of Mastering Tool Kit ("MTK") effect patches designed for just this purpose: to apply the finishing touches to a great mix.

If your VS-2400CD is connected to Roland DS-90A or DS-50A monitors (Page 73), you can insert a Speaker Modeling effect patch on the MASTER bus—see Page 219 for details.

Inserting Effects on the MASTER Bus

1. Press MASTER EDIT.
2. Press F2 (FXIns)—the MASTER EFFECT INSERT appears.



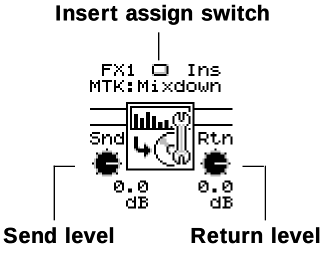
MASTER EFFECT INSERT

FX1 ☐ Off
FX2 ☐ Off
FX3 ☐→TR4
FX4 ☐ Off

Effect 3 is already inserted on Track Channel 4

The MASTER EFFECT INSERT screen operates in much the same way as the input and track channels' EFFECT INSERT screen, though it's a bit simpler: only one insert routing is needed for each effect since a MASTER bus insert effect always uses both sides of its processor.

3. Select the desired effect's insert assign switch and select:
   - *OFF*—so that the effect is not inserted on the MASTER bus.
   - *Ins*—to insert the effect on the MASTER bus.
4. As necessary, use the insert effect's Snd and Rtn controls to adjust the level of the signal coming into the insert effect or out of it, respectively.
5. Repeat Steps 3 and 4 for any other effects you want to insert on the MASTER bus.
6. Once you've set up your insert effects, select the desired effect patch for each—see "Selecting Effect Patches" on Page 215.



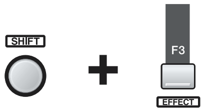
Insert assign switch

Send level

Return level

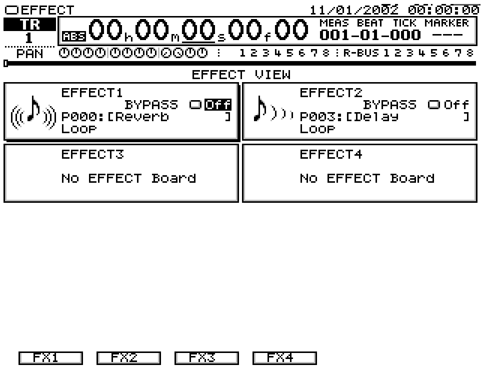
Selecting, Editing and Saving Effect Patches

You'll find the screens on which you select, edit and save effect patches in the EFFECT menu. To view the EFFECT menu, hold down SHIFT and press F3•EFFECT.


SHIFT
+
F3
EFFECT

The EFFECT VIEW Screen

When you press the EFFECT MENU button, the EFFECT VIEW screen appears. This screen shows you a menu of your effect processors, and provides basic information about each, as well as a BYPASS switch.


EFFECT
11/01/2002 00:00:00
TR 1
ABS 00h00m00s00f00
MEAS BEAT TICK MARKER
001-01-000 ---
PAN
1 2 3 4 5 6 7 8 : R-BUS 1 2 3 4 5 6 7 8
EFFECT VIEW
EFFECT1
BYPASS Off
P000:[Reverb]
Loop
EFFECT2
BYPASS Off
P003:[Delay]
Loop
EFFECT3
No EFFECT Board
EFFECT4
No EFFECT Board
FX1
FX2
FX3
FX4

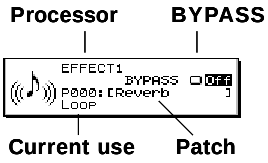
This VS-2400CD has only one VS8F-2 installed, so Effects 3 and 4 are unavailable.

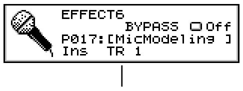
There's a box on the screen for each of the eight possible internal effects—if you haven't installed the optional VS8F-2 board required for an effect, you'll see "No EFFECT Board" in its box, as is the case with Effects 3 and 4 in the illustration above.

Information in the Effect Boxes

Each effect's box on the EFFECT VIEW screen shows:

- the name of the effect processor
- the name of its currently selected effect patch, along with a symbol representing the algorithm on which it's based.
- whether the effect is currently available as a loop effect or is currently in use as an insert effect—if it is, you can see where's it's inserted, as show below.


Processor
BYPASS
EFFECT1
BYPASS Off
P000:[Reverb]
Loop
Current use
Patch


EFFECT6
BYPASS Off
P017:[MicModeling]
Ins TR 1

This processor is currently inserted on Track Channel 1.

About the BYPASS Switch

The BYPASS switch on the EFFECT VIEW screen also appears as F5 (BYPASS) on other effect screens. It behaves the same way everywhere.

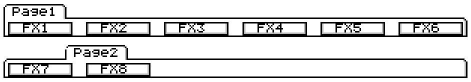
When a processor's Bypass feature is turned on, any signals sent to the processor go around it instead of through it, so the signals are not processed. In essence, the effect is turned off. Therefore, if BYPASS is:

- *Off*—the effect processor is on.
- *On*—the effect processor is off.

When a processor is bypassed, it remains that way until you reset its BYPASS switch.

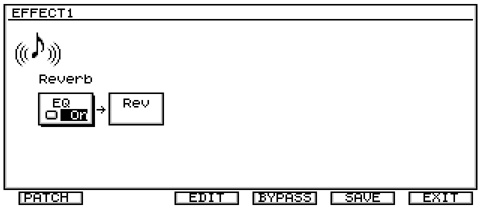
Setting Up an Effect Processor

At the bottom of the EFFECTVIEW screen are a pair of tabbed layers containing an F button for each of the eight effect processors.


Page1
FX1
FX2
FX3
FX4
FX5
FX6
Page2
FX7
FX8

Press PAGE, if necessary, to view the F button for the effect you want to work with. Press an effect's F button to view its Algorithm View screen.

The Algorithm View Screen


EFFECT1
Reverb
EQ
On
Rev
PATCH
EDIT
BYPASS
SAVE
EXIT

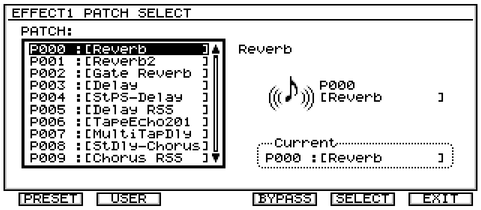
The Algorithm View screen is each effect processor's home page. It shows you a diagram of the algorithm on which the effect's currently selected patch is based. It also acts as the gateway to the screens on which you select, edit and save effect patches.

On the Algorithm View screen, press:

- *F1 (PATCH)*—to select an effect patch for the processor
- *F2 (EDIT)*—to edit the selected patch's parameters.
- *F4 (SAVE)*—to save the patch's current settings as a new effect patch.
- *F5 (BYPASS)*—to bypass the processor (see Page 214).
- *F6 (EXIT)*—to return to the EFFECTVIEW screen.

Selecting Effect Patches

When you press F1 (PATCH) on an effect processor's Algorithm View screen, its PATCH SELECT screen appears.


EFFECT1 PATCH SELECT
PATCH:
P000 :[Reverb]
P001 :[Reverb2]
P002 :[Gate Reverb]
P003 :[Delay]
P004 :[StPS-Delay]
P005 :[Delay RSS]
P006 :[TapeEcho201]
P007 :[MultiTapDly]
P008 :[StDly-Chorus]
P009 :[Chorus RSS]
Reverb
P000
[Reverb]
Current
P000 :[Reverb]
PRESET
USER
BYPASS
SELECT
EXIT

Preset and User Effect Patches

The VS-2400CD's memory contains 250 "preset" patches designed to meet a wide range of effect-processing needs. The preset patches can't be erased or modified—though you can use them as the basis for your own patches—so they're always there for you to use.

You can also store 200 of your own "user" patches in the VS-2400CD's memory. You can create these patches starting with the onboard effect algorithms—see "Starting from Scratch" below—or customize preset patches for your own use and save them as your own new user patches. Your collection of user patches is available in any project.

As shipped from the factory, the VS-2400CD's user patches are copies of the first 200 preset patches. Since they're only copies, you can replace them with your own user patches without fearing that you're losing anything.

Starting from Scratch

The VS-2400CD's 36 effect algorithms (Page 54) are the foundation on which effect patches are built. To build your own effect patch from scratch, begin with one of the first 36 preset patches: P000-P035. These patches use each algorithm's default settings.

Effect Patch Prefixes, Numbers and Names

Each effect patch is named using a specific set of naming conventions that provides information about the patch. Each patch has a:

- *prefix*—that tells you if it's a preset patch or a user patch. If the patch's name starts with a "P," it's a preset patch. If it starts with "U," it's a user patch.
- *number*—that shows you the patch's position in the patch list.
- *name*—that describes the patch. If the patch isn't a default patch (see above), its name is preceded by an abbreviation that tells you the algorithm it's based on. A default patch's name is the name of its algorithm.

Match the Patch to the Processor

Due to the processing requirements of some of the effect algorithms, not all patches can be used by all of the processors.

Effect patches based on the following algorithms can't be selected for the even-numbered effect processors, Effect 2 and 4:

- Reverb
- Voice Transformer
- Gate Reverb
- Mastering Tool Kit
- Vocoder2 (19)

In the patch list for the even-numbered processors, any patches based on these algorithms are grayed-out and unselectable.

Since the following algorithms require two effect processors, they can only be selected for odd-numbered processors—Effect 1 or 3—and the selected processor's even-numbered partner—Effect 2, or 4, respectively—becomes unavailable for other use:

- Vocoder2 (19)
- Voice Transformer
- Mastering Tool Kit

If on odd-numbered processor uses a patch based on one of these algorithms, the EFFECT VIEW box and F button for its even-numbered partner is grayed-out.

Match the Patch to the Project

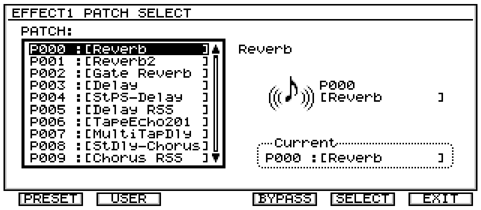
When a project's sampling rate is 64 kHz or higher—see Page 92—patches based on the following algorithms become grayed out and can't be used:

- Reverb
- Voice Transformer
- Mastering Tool Kit
- Gate Reverb
- Mic Modeling
- Vocoder2 (19)
- Speaker Modeling

Selecting an Effect Patch

To navigate to an effect's PATCH SELECT screen if you're not already there:

1. Hold down SHIFT and press F3•EFFECT.
2. Press the processor's F button to display its Algorithm View screen.
3. Press F1 (PATCH).



EFFECT1 PATCH SELECT

PATCH:

P000 :[Reverb]
P001 :[Reverb2]
P002 :[Gate Reverb]
P003 :[Delay]
P004 :[StPS-Delay]
P005 :[Delay RSS]
P006 :[TapeEcho201]
P007 :[MultiTapDly]
P008 :[StDly-Chorus]
P009 :[Chorus RSS]

Reverb

P000
[Reverb]

Current
P000 :[Reverb]

To select an effect patch on the PATCH SELECT screen:

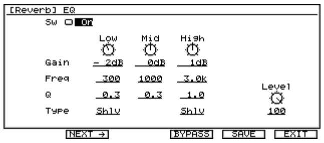
1. Press F1 (PRESET) to jump to the first preset effect patch in the patch list, or press F2 (USER) to jump to the first user patch.
2. Turn the Time/Value dial to select the desired patch. You can use the dial to scroll through all of the preset and user patches if you want to.
3. Press F5 (SELECT) to load the selected effect patch.

The *VS-2400CD Appendices* contains an effect patch list that tells you whether a patch is designed for use as a loop or insert effect. The list also tells you if the patch has stereo inputs—so it treats its left and right sides independently—or if its input is mono.

The BYPASS switch is explained on Page 214. Press F6 (EXIT) to return to the processor's Algorithm View screen.

Editing Effect Patches

Press F3 (EDIT) on an effect processor's Algorithm View screen to view the first editing screen for the selected effect patch. In the illustration below, you can see the two editing screens for the first effect patch, P000 Reverb.

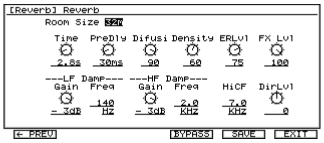


[Reverb] EQ

Sw On

	Low	Mid	High
Gain	- 2dB	0dB	1dB
Freq	300	1000	3.0k
Q	0.3	0.3	1.0
Type	Shlv		Shlv

Level 100



[Reverb] Reverb

Room Size 32m

Time	PreDly	Difusi	Density	ERLvl	FX Lvl
2.8s	30ms	90	60	75	100

---LF Damp--- Gain	---LF Damp--- Freq	---HF Damp--- Gain	---HF Damp--- Freq	HiCF	DirLvl
- 3dB	140 Hz	- 3dB	2.0 KHz	7.0 KHz	0

Each algorithm provides a set of parameters with which you can change the effect processing it produces. To learn about each algorithm's parameters, see the *VS-2400CD Appendices*. When you edit a patch, you edit the values for the algorithm—or algorithms—on which the patch is based.

← PREV NEXT →

It’s not uncommon for a patch to have more parameters than will fit on one screen. When this is the case, you can navigate between the patch’s screens by pressing F2 (NEXT) to move to the next editing screen, or F1 (PREV) to move back.

All changes you make to a patch can be heard as soon as the next signal is sent into the effect processor.

Editing an Effect Patch

To navigate to an effect’s first editing screen if you’re not already there:

1. Hold down SHIFT and press F3•EFFECT.
2. Press the processor’s F button to display its Algorithm View screen.
3. Press F3 (EDIT).

To edit an effect patch on any of its editing screens:

1. Select a parameter you want to edit.
2. Set its value as desired.

Effect and Direct Level Settings

Many effect patches offer FX Lvl (“effect level”) and DirLvl (“direct level”) parameters. These two parameters are of special importance since they set the balance between wet and dry signals. FX Lvl sets the level of the processed signal, while DirLvl sets the level of the original signal. Both parameters have a range from -100 to 100, with 0 silencing the effected or original signal, respectively.

If a patch is designed for use as a loop effect, it’ll be added to the dry input or track channel signal in the MASTER mix or on tracks.Therefore, FX Lvl is typically set to 100, the maximum volume, and DirLvl is set to 0.

With an insert effect, on the other hand, the effect’s output replaces the original signal, so the FX Lvl and DirLvl values are more similar. While great care has been taken to pre-program the right FX Lvl/DirLvl balance for each patch, you may wish to adjust these settings for your project.

Preserving Patch Edits

There are two ways you can preserve an effect patch edit.You can:

- Save your current mixer settings—including your effect settings—as a scene, as described in “Scenes” on Page 139.
- Save your effect patch edits as a new user patch, as described below.

Saving Effect Patches

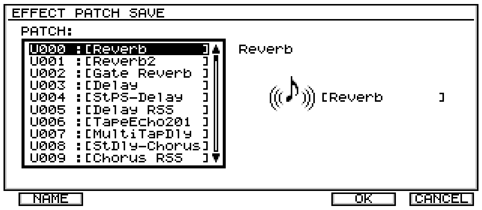
From an effect processor’s Algorithm View screen or any of its edit screens, you can press F5 (SAVE) to store the patch’s current parameter values as your own user effect patch (see “Preset and User Effect Patches” on Page 216).

When you press F5 (SAVE), the EFFECT PATCH SAVE screen appears, and the list of 200 user patches is presented.You can replace any of the current user patches with your new effect patch.

Until you begin saving your own patches, all of the user effect patches are merely copies of the first 200 preset patches, so feel free to replace any of them—you won't be losing anything you don't already have as a preset patch.

Saving an Effect Patch

1. Hold down SHIFT and press F3•EFFECT.
2. Press the processor's F button to display its Algorithm View screen.
3. Press F3 (EDIT).
4. Edit the patch as desired.
5. Press F5 (SAVE) to view the EFFECT PATCH SAVE screen.



To save an effect patch on the EFFECT PATCH SAVE screen:

1. Turn the Time/Value dial to select one of the 200 user effect patch memory locations. The patch currently residing the selected location will be replaced with the new patch you're saving.
2. If you'd like to cancel the patch-saving operation, press F6 (CANCEL).
3. Press F5 (OK) to store your current patch settings as a new user patch in the selected user memory location.
4. Press F1 (NAME) and name the new patch—to learn about naming, see Page 71.
5. Press F5 (OK) when you're done.

Speaker Modeling

If you're using Roland's DS-90A or DS-50A Digital Reference Monitors, you can take advantage of the VS-2400CD's Speaker Modeling feature. Speaker Modeling allows your DS-90As or DS-50As to simulate the sound of a wide range of speakers, including popular studio monitors and consumer stereo speakers. Since the trickiest part of mixing is making sure your audio sounds good no matter where it's heard, Speaker Modeling great because it lets you to try out your mix on a variety of virtual systems.

Using Speaker Modeling

1. Insert an effect on the MASTER bus as described on Page 213.
2. Hold down SHIFT and press F3•EFFECT.
3. Press the F button for the effect you selected in Step 1.
4. Press F1 (PATCH).
5. The Speaker Modeling effects patches are P220-P-230. Each patch is an emulation of a different kind of speaker—the patch's icon shows you the speaker it's based on.

See the *VS-2400CD Appendices* for a list of the Speaker Modeling patches.

6. Press F (SELECT) to choose the desired model.

Microphone Modeling

Microphone modeling can make audio captured by an inexpensive mic sound like it's been captured by one of the world's best studio mics.

In order to create a realistic microphone model, the VS-2400CD needs to know the sonic characteristics of the mic you're really using. The VS-2400CD's Microphone Modeling effect patches are designed to work with several different mics:

- Roland DR-20
- SM-10 (headset mic)
- AKG C3000B
- Lavalier (necklace) mic
- Shure SM-57

If you have one of these mics, you can insert an effect on your mic's input channel and select the desired Microphone Modeling effect patch to transform the sound of your microphone.

Using Microphone Modeling

1. Insert the desired effect on your mic's input channel as described on Page 211.
2. Hold down SHIFT and press F3•EFFECT.
3. Press the F button for the effect you selected in Step 1.
4. Press F1 (PATCH).
5. The Microphone Modeling effects patches are P110-P-138. Select a patch based on the kind of mic you're using.

See the *VS-2400CD Appendices* for a list of the Microphone Modeling patches.

6. Press F (SELECT) to choose the desired model.

RSS PAN

The VS-2400CD's RSS Pan effect adds a rich 3-dimensionality to stereo audio signals, offering intelligent control of the size and even the placement of the sound in the listening space.

The number of signals that can be simultaneously processed by RSS Pan depends on the project's sample rate. When a project uses:

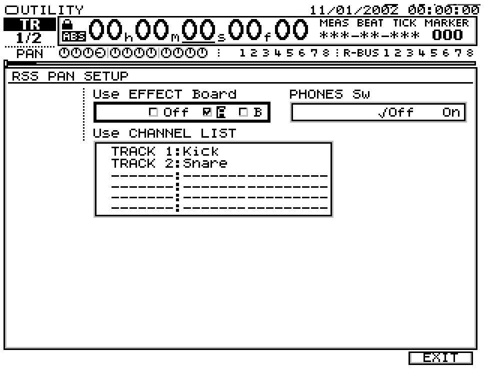
- *32 kHz, 44.1 kHz or 48 kHz*—up to six channels' signals can be sent to the RSS Pan effect.
- *96 kHz, 88.2 kHz or 64 kHz*—up to three channels' signals can be sent to the RSS Pan effect.

RSS Pan can be used only with unlinked channels.

The RSS Pan effect requires the use of one of the VS-2400CD's effect boards. When the board is allocated to RSSPan, it can't be used for other effects or the analyzer.

To Configure the RSS Pan Feature:

1. Hold down SHIFT and press F4•UTILITY.
2. Press PAGE repeatedly until “RSSPan” appears above F2.
3. Press F2 (RSSPan)—the RSS PAN SETUP screen appears:



RSS PAN SETUP

Use EFFECT Board: ☐ Off ☑ A ☐ B

PHONES Sw: √Off On

Use CHANNEL LIST:
TRACK 1:Kick
TRACK 2:Snare

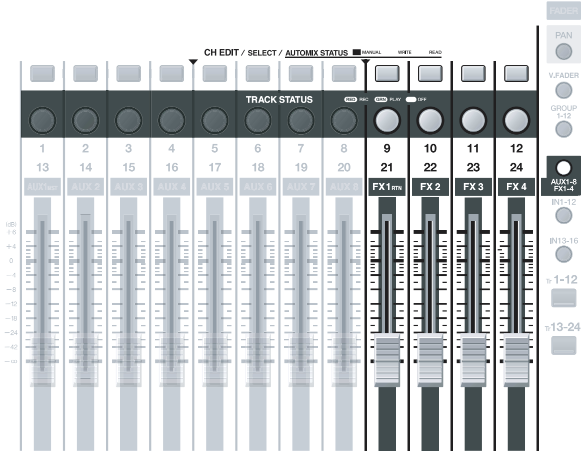
4. Cursor to the Use EFFECT Board parameter and turn the Time/Value dial to select the effect board you’d like to use for producing the RSS Pan effect. You can select Off—for no RSS Pan—or VS8F-2 A or B.

You can use the B effect board only if your VS-2400CD has two VS8F-2s installed.

5. Press ENTER/YES to confirm your selection.
6. If you’d like to hear RSS Pan in your PHONES jack, turn the PHONES Sw on.
7. To select the first channel to which you’d like to apply RSS Panning. cursor down to the top line in the USE CHANNEL LIST box and turn the Time/Value dial to select the desired input or track channel.
8. To send additional channels’ signals to the RSS Pan effect, cursor to the other lines in the Use CHANNEL LIST box and turn the Time/Value dial to select the desired channel or channels.

17—Working with FX Return Channels

When you press AUX 1-8/FX 1-4, the four right-most channel strips—labeled "FX RTN 1-4"—are FX return channels that control the stereo outputs of Effects 1-4, respectively, when they're set up as loop effects.


CH EDIT / SELECT / AUTOMIX STATUS
MANUAL
WRITE
READ
TRACK STATUS
REC
PLAY
OFF
FADER
PAN
V.FADER
GROUP 1-12
1
13
2
14
3
15
4
16
5
17
6
18
7
19
8
20
9
21
10
22
11
23
12
24
AUX1
AUX 2
AUX 3
AUX 4
AUX 5
AUX 6
AUX 7
AUX 8
FX1 RTN
FX 2
FX 3
FX 4
AUX1-8 FX1-4
IN1-12
IN13-16
Tr 1-12
Tr 13-24

AUX 1-8/FX 1-4 is lit.

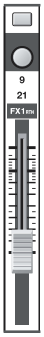
When an effect is inserted on an input or track channel, or the MASTER bus, it requires no FX return channel. Therefore, if this is the case, the effect's FX return channel is de-activated.

When the VS-2400CD is shipped from the factory, Effects 1 and 2 available. You can install an optional VS8F-2 effect expansion board to add another pair of stereo effects, up to a total of four stereo effects.

What Does an FX Return Channel Do?

Each FX return channel provides a set of controls for the stereo signal produced by its corresponding effect processor, Effect 1-4. An FX return channel has a stereo fader with which you can set the level of the effect. It also provides a set of CH EDIT tools that let you manage the effect and send it to the MASTER mix, print the effect to hard disk recorder tracks, or to Aux or Direct paths.

The FX Return Channel Fader



An FX return channel fader sets the level of the corresponding effect's stereo output as it's sent to the desired destination—most often either the MASTER mix or one or two tracks in the hard disk recorder. The position of the fader is reflected in the FX return channel's CH EDIT FADER parameter value. Changing the FADER value is the same as moving the physical fader.

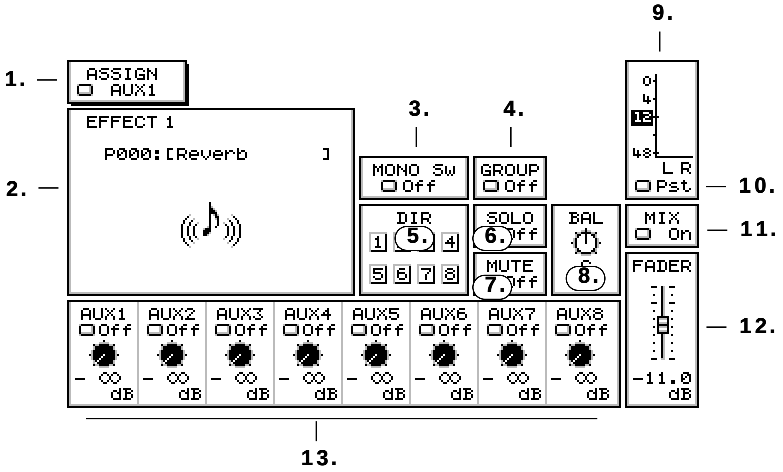
FX Return CH EDIT Tools

Each FX return channel has three FX return CH EDIT screens. It has a:

- main CH EDIT screen (see Page 224)
- Parameter View screen (Page 227)
- SURROUND screen (Page 310)

The Main FX Return CH EDIT Screen

1. Press AUX 1-8/FX 1-4 to activate channel strip control of FX Return Channels 1-4.
2. Press the desired FX return channel's CH EDIT button—its main CH EDIT VIEW screen appears.


1.
ASSIGN
AUX1
2.
EFFECT 1
P000:[Reverb]
3.
MONO Sw
Off
4.
GROUP
Off
DIR
1 4
5 6 7 8
5.
SOLO
6.
MUTE
7.
BAL
8.
9.
0
4
12
48
L R
Pst
10.
MIX
On
11.
FADER
12.
-11.0
dB
AUX1 AUX2 AUX3 AUX4 AUX5 AUX6 AUX7 AUX8
Off
-∞
dB
13.

1. ASSIGN

ASSIGN
AUX1

The ASSIGN selector designates the Aux bus that carries signals to the FX return channel's effect processor. This parameter interacts with, and reflects the setting of, the EZ ROUTING EFFECT screen described on Page 204.

2. EFFECT Algorithm Display

EFFECT 1
P000:[Reverb]

The EFFECT algorithm display shows the algorithm on which the effect's currently selected patch is based. When the display is selected, the ENTER/YES button flashes—press the ENTER/YES button to jump to the effect's Algorithm View screen (Page 215).

3. MONO Sw

The MONO Sw ("Mono Switch") allows you to collapse the left and right sides of the stereo effect into a mono signal. To restore the effect to stereo, turn Mono Sw off.

When the effect's output is mono, you can use its BAL (Page 225) parameter to pan the effect to the desired location.

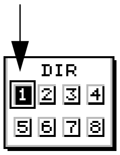
4. GROUP

You can assign the effect's output to any of the VS-2400CD's 12 fader groups that allow you to control the levels of multiple input, track and/or FX return channels. The parameter operates in exactly the same way as the input and track channel GROUP parameter—see Page 150.

You can control the level of the 12 faders groups using the VS-2400CD's faders. See "Controlling Fader Group Levels with the Channel Strips" on Page 135.

5. DIR 1-8

DIR Bus 1 is selected and highlighted here.



Using the DIR 1-8 parameters, you can route the effect to an output after sending in to any of the eight Direct paths (Page 202). You can use a pre- or post-fader Direct path, as explained on Page 203. Chapter 21 describes working with the VS-2400CD outputs.

To send an effect to a Direct path from its FX return channel:

1. Select the desired DIR parameter box.
2. Turn the Time/Value dial so that the desired Direct path becomes highlighted.

Only one channel's signal can be routed to a Direct path at a time. When you assign a channel to a Direct path, it replaces the channel that had previously been routed to the bus. For a list of the channels currently routed to the Direct paths, press ENTER/YES. Press EXIT/NO to close the list.

6. SOLO

Turn SOLO on to quickly isolate the effect by turning off any other channels whose SOLO switched is not turned on. When you want to solo multiple signals, use Solo Mode (Page 138)—it's faster.

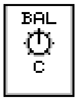
When an effect is soloed in Solo Mode, its SOLO switch is automatically turned on.

7. MUTE

Use the MUTE switch to quickly silence the effect's output. To mute more than one channel, you'll probably find it easier to use Mute mode (Page 138).

When an effect is muted in Mute Mode, its MUTE switch is automatically turned on.

8. BAL

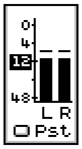


The BAL ("Balance") control sets the stereo placement of the effect when it's sent to a stereo destination such as the MASTER mix or a pair of linked tracks. The BAL parameter shifts the effect's entire stereo image leftward or rightward while maintaining the positions of its left and right sides in relation to each other. The parameter can be set from L63 to R63.

When Mono Sw is turned on, BAL acts as a simple pan control of the effect's mono signal.

9. Effect Output Meter

10. Effect Output Meter Pre/Pst Switch



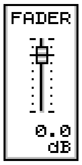
The Effect output meter shows the effect's output level as it's sent to the selected destination. The meter can show pre- or post-fader levels. Most of the time, you'll want to view post-fader levels to see the effect's true output level. If you're sending the effect pre-fader to one or two Aux busses (Page 226) or Direct paths (Page 225), you may want to view its pre-fader level to see what you're sending.

11. MIX

When MIX is turned on, the effect is sent to the MASTER bus. When it's off, it's not. To add the effect to a mix, make sure MIX is turned on.

Listen to an effect as you record a track—without recording the effect—by sending the track channel's signal to the effect, setting MIX to On and making sure the effect isn't routed to the track (Page 227). You'll hear the effect in the MASTER mix as you record.

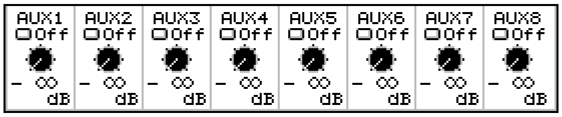
12. FADER



The FADER parameter's value sets the output level of the effect. The FX return channel's physical fader and this parameter serve the same purpose, and changing the setting for one changes the setting for both.

13. AUX Send Controls

Each FX return channel has a set of eight Aux send controls with which you can send the effect to any Aux bus or pair of linked Aux busses.

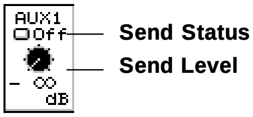


You can use these controls to send the effect to:

- *headphone mixes*—You can send the effect to an Aux bus routed to an output that's connected to a performer's headphone amplifier input. This procedure is described in detail in "Adding Effects to a Headphone Mix" on Page 230.
- *another effect*—You can create a chain of effects in the VS-2400CD by sending one effect's output to an Aux bus routed into another effect's input. If you want, you can repeat the process by sending the second effect to a third and so on.
- *external devices*—Send the effect to Aux busses routed to outputs connected to an external device.

Though the VS-2400CD doesn't prevent you from doing so, sending an effect's output to the Aux bus routed to its input can produce unpredictable results.

The Aux send controls provide the following parameters:



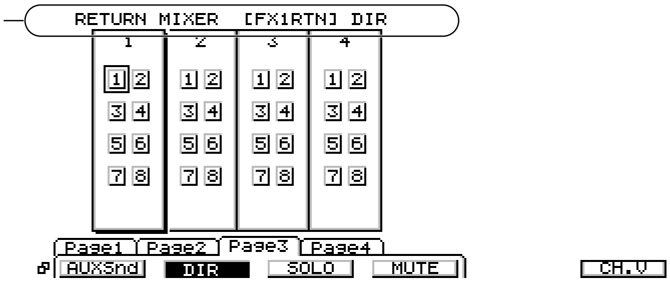
- *Send Status*—turns the Aux send to the Aux bus on or off. You can select:
  - *OFF*—so that the effect isn't sent to the Aux bus.
  - *Pre or Pst (depending on the Aux bus's current configuration)*—to turn on the send to the Aux bus from the channel. See below for more details.

The Send Level parameter sets the amount of the channel's signal to be sent to the Aux bus. The range is from -∞ to 6 dB.

You can also set the effect's send level using the channel faders—see "Activating Fader Control of Aux Send Levels" on Page 136.

Each Aux bus can receive signals pre- or post-fader, and can be linked to its odd/even partner. When you select an Aux send control's send status parameter, ENTER/YES flashes—press ENTER/YES to configure the Aux bus as described on Page 201.

The FX Return Parameter View Screen



Selected channel and parameter

The FX return channels' Parameter View feature lets you view, and adjust the value of, the currently selected parameter for all of the FX return channels at once.

To activate Parameter View, press F6 (PRM.V) from an FX return channel's main CH EDIT screen. F6 (PRM.V) is available only when the currently selected parameter can be displayed in Parameter View. The F2 (Surrnd) button is active only when the UTILITY menu's SURROUND MIX Sw parameter (Page 309) is turned on.

To return to the main FX return CH EDIT screen, press F6 (CH.V).

If you edit a parameter while in Parameter View, its channel automatically becomes the currently selected channel.

At the bottom of the Parameter View screen are four tabbed layers on which you'll find an F button for each of the parameters that can be shown using Parameter View. To reveal a parameter on a layer that's hidden, press PAGE until the layer appears.

The Eight Aux Send Controls in Parameter View

The Parameter View screen can't fit all eight FX return channel Aux send controls onscreen at the same time. You can press ▼ or ▲, or click either arrow with your mouse, to scroll through the Aux send control parameters for each of the eight Aux busses. At the top of the PRM.V section of the display, you'll see the name of the currently displayed Aux send.

Routing Effects to Tracks

You can route an FX return channel's output to a pair of tracks, or a single track, to record the effect, by itself or mixed in with the signal(s) it's processing. The FX return channel's fader—and FADER parameter—set the effect's recording level.

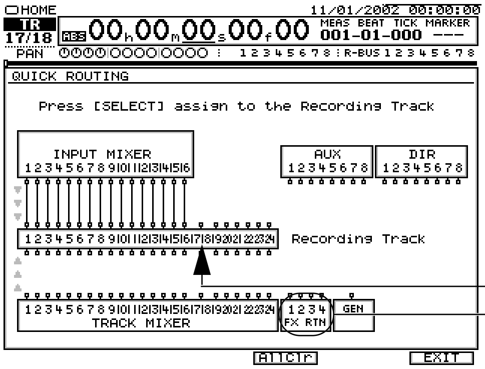
You can add an effect to tracks you're bouncing by routing its FX return channel's output to your bounce destination track or track pair—see Page 191.

Each FX return channel's stereo output appears during routing as a single connection, with a single virtual wire you can connected to a pair of linked tracks. If you route an FX return channel to a single track, the effect is recorded as a mono signal containing both its left and right sides.

In the following sections, we describe how to route an FX return channel's stereo output to a pair of tracks, the most common scenario. You can use the same steps to route an effect in mono to a single, unlinked track.

Quick Routing an FX Return Channel

1. Press Tr 1-12 or Tr 13-24 to select the group of channels that contains the track channels for the linked pair of tracks to which you want to send the effect.
2. Hold down either destination track channel's TRACK STATUS button for a second or so until the QUICK ROUTING screen appears.


HOME
11/01/2002 00:00:00
TR 17/18
ABS 00h00m00s00f00
MEAS BEAT TICK MARKER
001-01-000 ---
PAN
R-BUS
QUICK ROUTING
INPUT MIXER
AUX
DIR
Recording Track
TRACK MIXER
FX RTN
GEN
AllClr
EXIT

Press [SELECT] assign to the Recording Track

Hard Disk Recorder Tracks 1-24

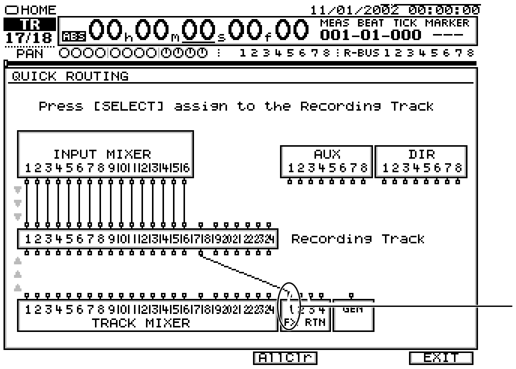
We pressed the TRACK STATUS button for linked Track 17. Tracks 17 and 18 are flashing to show they're selected as our destination.

FX Return Channels 1-4

The FADER button you pressed in Step 1 and the pair of TRACK STATUS buttons you lit in Step 2 light solidly to show the currently active group of SELECT buttons and the linked tracks you've chosen as the destination for your effect. If any channels are already routed to the tracks, their SELECT buttons also light solidly.

To clear all connections to a destination track, hold down its TRACK STATUS button and press CLEAR. To quickly clear all of the QUICK ROUTING screen's connections, press F4 (AllClr).

3. Press AUX 1-8/FX 1-4.
4. Press the FX return channel's SELECT button—a virtual wire appears on the screen to show the connection you've made.


HOME
11/01/2002 00:00:00
TR 17/18
ABS 00h00m00s00f00
MEAS BEAT TICK MARKER
001-01-000 ---
PAN
R-BUS
QUICK ROUTING
INPUT MIXER
AUX
DIR
Recording Track
TRACK MIXER
FX RTN
GEN
AllClr
EXIT

Press [SELECT] assign to the Recording Track

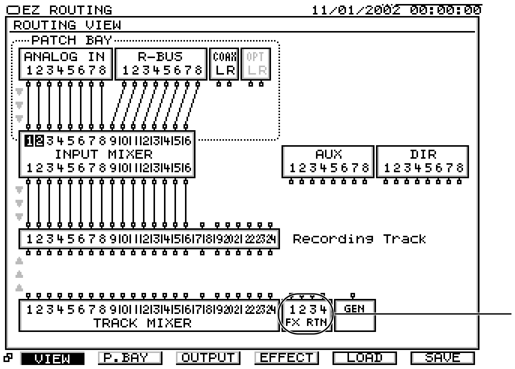
The gray arrows at the left edge of the screen show the direction in which signal flows. When you're recording effects onto tracks, signal flows up from the FX return channels to the hard disk recorder tracks.

We pressed FX Return Channel 1's SELECT button.

5. If you want to break the connection, press SELECT again.
6. When you're done, press F6 (EXIT) to confirm the new connection and to leave Quick Routing.

FX Return Routing on the EZ Routing VIEW Screen

1. Press EZ ROUTING.

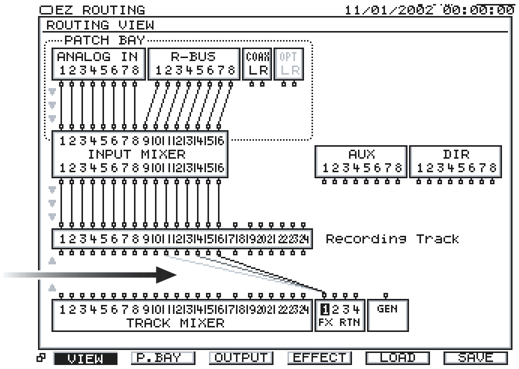

EZ ROUTING
11/01/2002 00:00:00
ROUTING VIEW
PATCH BAY
ANALOG IN
R-BUS
COAX
OPT
INPUT MIXER
AUX
DIR
Recording Track
TRACK MIXER
FX RTN
GEN
VIEW
P.BAY
OUTPUT
EFFECT
LOAD
SAVE

Hard Disk Recorder Tracks 1-24

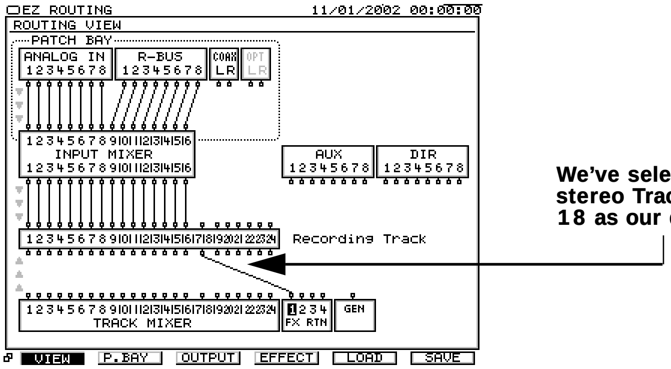
The gray arrows at the left edge of the screen show the direction in which signal flows. When you're recording effects onto tracks, signal flows up from the FX return channels to the hard disk recorder tracks.

FX Return Channels 1-4

2. If the ROUTING VIEW screen doesn't appear, and you see "VIEW" above F1, press F1 (VIEW). If you don't see "VIEW" above F1, press PAGE and then F1 (VIEW).
3. Use ◀, ▶, ▲ and/or ▼ to select the FX return channel's output along the upper edge of the FX RTN block. We've selected FX Return Channel 1's output in the illustration above.
4. Turn the Time/Value dial clockwise—a wire appears that connects the FX return channel to one track after another in the RECORDING TRACKS block.


EZ ROUTING
11/01/2002 00:00:00
ROUTING VIEW
PATCH BAY
ANALOG IN
R-BUS
COAX
OPT
INPUT MIXER
AUX
DIR
Recording Track
TRACK MIXER
FX RTN
GEN
VIEW
P.BAY
OUTPUT
EFFECT
LOAD
SAVE

5. Turn the dial to select the desired pair of destination linked tracks.


EZ ROUTING
11/01/2002 00:00:00
ROUTING VIEW
PATCH BAY
ANALOG IN
R-BUS
COAX
OPT
INPUT MIXER
AUX
DIR
Recording Track
TRACK MIXER
FX RTN
GEN
VIEW
P.BAY
OUTPUT
EFFECT
LOAD
SAVE

We've selected linked stereo Tracks 17 and 18 as our destination.

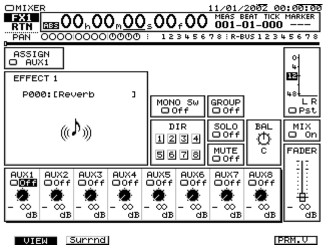
6. To break the connection, repeat Steps 3 and 4, and turn the Time/Value dial counter-clockwise until no connection exists.

To clear all FX effect-to-track connections, press PAGE until "ClrTrA" appears above F4, and then press F4 (ClrTrA).

Adding Effects to a Headphone Mix

When you've created a headphone mix using an Aux bus, it's easy to add an effect to any of its signals. Send each channel's signal to the effect as desired. The following steps describe how to route the effect to the Aux bus:

1. Press AUX 1-8/FX 1-4 to select the group of channels that includes the four FX returns channels.
2. Press the CH EDIT button for the FX return channel belonging to the effect you want to send to the headphone mix. The FX return channel CH EDIT parameters appear.
3. Set the Send Status parameter for the Aux bus you're using to its available Pre or Post value, depending on the Aux bus's configuration (Page 201).


MIXER
11/01/2002 00:00:00
FX1 RTN
ABS 00h00m00s00f00
MEAS BEAT TICK MARKER
001-01-000 ---
PAN
1 2 3 4 5 6 7 8 : R-BUS 1 2 3 4 5 6 7 8
ASSIGN AUX1
EFFECT 1
P000:[Reverb]
MONO Sw Off
GROUP Off
DIR
1 2 3 4
5 6 7 8
SOLO Off
MUTE Off
BAL C
0
4
12
48
L R
Pst
MIX On
FADER
AUX1 Off
AUX2 Off
AUX3 Off
AUX4 Off
AUX5 Off
AUX6 Off
AUX7 Off
AUX8 Off
-∞ dB
VIEW
Surrnd
PRM.V

Aux 1's Send Status parameter

4. Set the amount of the effect to be sent to the headphone mix.

For the effect to sound its best, use a linked pair of Aux busses for a stereo headphone feed. In Steps 4 and 5 above, you'll be setting up both linked Aux busses simultaneously—use the linked Aux busses' balance control to position the stereo effect as desired in the mix.

You can also set the send level using the VS-2400CD's faders—see "Activating Fader Control of Aux Send Levels" on Page 136.

18—Editing Tracks

This chapter provides an introduction to the editing of audio data on VS-2400CD tracks. The first part of the chapter explains important editing concepts. The second part explains how to use the various available editing methods.

Chapter 6 explains how audio data is recorded on the VS-2400CD, and provides explanations for some important terms: take, phrase, V-Track and track. See Page 84.

Remember that when you're editing a track, what you're really editing is its currently selected V-Track.

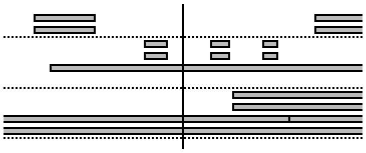
Editing Concepts and Overview

Phrases and Regions

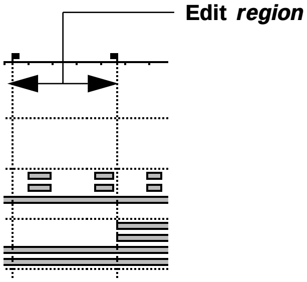
In editing a track, you can work:

- pre-defined chunks of audio called "phrases." You can work with one phrase at a time on each track, or you can work with phrases on multiple tracks at the same time. Chapter 19 discusses the things you can do with phrases.

Each rectangle in the Home screen's playlist is a *phrase*



- a specified time "region" in one or more tracks. Region editing operations are described in detail in Chapter 20.



To master the powerful editing features of the VS-2400CD, it's important to understand exactly what a phrase is. See "What's Pointer-Based Playback?" on Page 84 if you haven't already read it.

If you want to edit multiple phrases on a track at the same time, you can define a region that includes the phrases.

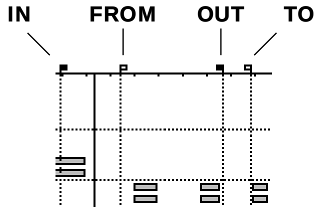
Earlier V-Studios referred to regions as "tracks." Some of the VS-2400CD's editing features also use this word instead of "region."

Edit Points

The VS-2400CD provides a set of special markers just for editing—these markers are called "edit points." The IN and OUT edit points define regions of data. The FROM and TO edit points help you position phrases and regions you're moving or copying.

Use the VS-2400CD's Scrub feature for the most precise positioning of the now line when you're placing edit points. Scrub is described on Page 178.

Edit Point Flags



In the playlist, each edit point is shown as a dotted line with a flag at its top. Each point has its own flag.

The FROM point is set to the same location as the IN point by default—you won't see its flag when it's behind the IN flag. You can manually move the FROM point to a different location, as described in this chapter.

IN and OUT

In region editing, the process begins with selecting the portion of the project you want to edit. You define this time range by placing the IN and OUT edit points:

This edit point:	*Sets:*
IN	the beginning of the section of data you want to work with.
OUT	the end of the section of data you want to work with.

You should never place your OUT edit point at an earlier location in the project than your IN edit point.

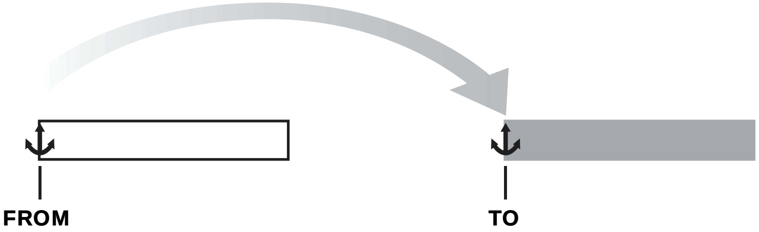
FROM and TO

Whenever you move or copy a phrase or region, you begin by designating a specific reference point within the phrase or region—a "time anchor," if you will. (The VS-2400CD does this for you automatically, as described below.) This anchor can be the beginning of the phrase or region, or it can be an event somewhere in the middle of it.

When you select a location to which you want to move or copy a phrase or region, what you're really doing is selecting a location to which you want to move or copy its anchor.

This edit point:	*Sets:*
FROM	the time anchor within a phrase or region.
TO	the location to which you want to move or copy the time anchor.

Most often when you move or copy a phrase or region, you'll want to place the front of the moved or copied data at the desired time destination.

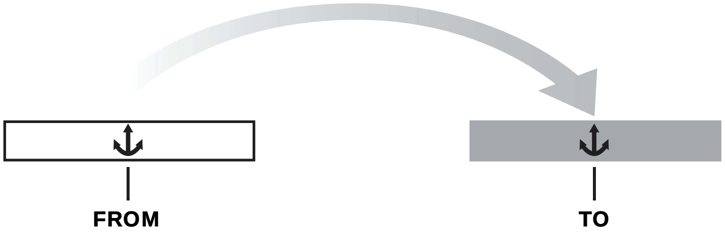


Therefore, as a convenience:

- when you select a phrase, the VS-2400CD automatically places the FROM point at the beginning of the phrase. If you select multiple phrases, FROM is placed at the front of the first phrase you select.
- when you place an IN point to define the beginning of a region, the VS-2400CD automatically sets FROM to the same location. If you select multiple regions, FROM is placed at the front of the first region you select.

You can manually reset FROM to any location you desire using the methods described later in this chapter.

If you set FROM at an event within a phrase or region, you can use the event's target location as a way to position the entire phrase or region.



For example, when:

- *you're copying a one-measure drum loop and can't find the exact start of the downbeat*—Place FROM at an easily identified, loud, repeated event, such as a snare drum hit on the second beat. Place TO at the second beat of the destination measure. When you copy the loop, the snare—along with the rest of the loop—lands in the pocket.
- *you're moving a music cue with a passage that has to occur at a specific time*—Place FROM at the beginning of the passage. Place TO where you want the passage to start. Move the entire cue and the passage lands in exactly the right place.

FROM and TO also make it easy to accurately position sound effects you've recorded or imported.

Using the IN, OUT, FROM and TO Buttons

You can set your IN, OUT, FROM and TO edit points using the VS-2400CD's IN, OUT, FROM and TO buttons. You can also jump immediately to any of these edit points by pressing its button.

Placing Edit Points Using the IN, OUT, FROM and TO Buttons

To set edit points for the first time in a project using the VS-2400CD's buttons:

1. Position the timeline at the desired location.
2. Hold down SHIFT and press the desired IN, OUT, FROM or TO button.
3. To clear an edit point, hold down SHIFT and CLEAR buttons. Then press the desired IN, OUT, FROM or TO button.

Once you've set a project's IN, OUT, FROM and TO points, their buttons can be configured so that pressing an edit point's button:

- moves the timeline to its position.
- resets the edit point to the current position of the timeline.

Configuring the Behavior of the IN, OUT, FROM and TO Buttons

1. Hold down SHIFT and press F4•UTILITY.
2. If "GLOBAL" doesn't appear over F2, press PAGE until it does.
3. Press F2 (GLOBAL).
4. The EDIT POINT Sw TYPE parameter sets the behavior of the IN, OUT, FROM and TO buttons for resetting your IN, OUT, FROM or TO edit points. You can choose:
   - *Same as LOCATOR*—so that pressing an edit point's button moves the timeline to the edit point's location in the project.
   - *OVERWRITE*—so that pressing an edit point's button resets the edit point to the current position of the timeline.
5. Press F6 (EXIT) to confirm your changes and to leave the GLOBAL Param1 screen.

If EDIT POINT Sw TYPE is set to OVERWRITE, you can still move the timeline to an edit point—hold down SHIFT and press the desired IN, OUT, FROM or TO button.

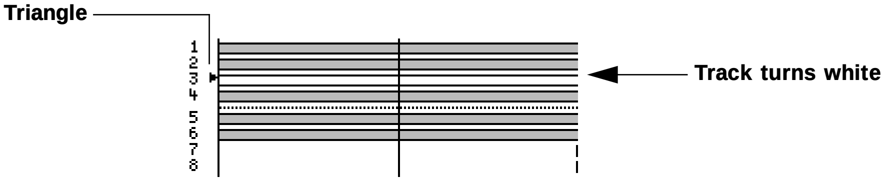
Performing Edits

The Appearance of Selected Tracks, Phrases and Regions

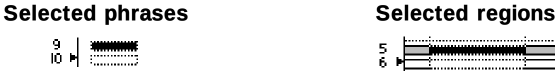
Depending on the method you use to select a phrase or region in the playlist—we'll describe these methods later in this chapter—the process can have two steps:

1. Select the track on which the desired phrase or region resides.
2. Select the phrase or region.

When a track, phrase or region is selected, its appearance changes. When a track is selected, a triangle appears to its left and the track turns white.



When a phrase or region is selected, it's outline becomes dotted.



When audio is selected, it has a dotted outline. If its track is also selected, it's white. If not, it's black.

If you select audio on one of a pair of linked tracks, the audio on the other linked track is also selected.

Where Editing Takes Place

You'll edit tracks on the VS-2400CD's Home screen—see Chapter 8—or on the wave display, described on Page 235. Each screen offers a different view of a project's audio.

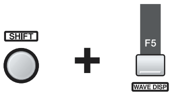
The Wave Display

The wave display is a companion to the Home screen's playlist and can be opened whenever the Home screen is visible.

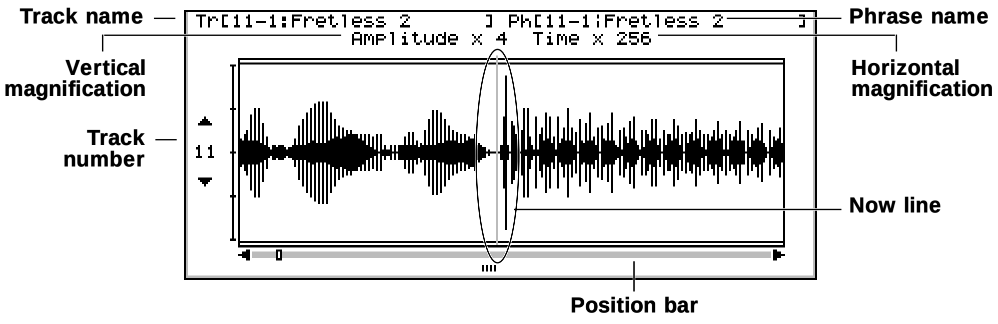
Press STOP before opening or closing the wave display. The WAVE DISPLAY button is disabled when a project is playing.

To open and close the wave display:

1. Press HOME•DISPLAY.
2. Hold down SHIFT and press F5•WAVE DISP—the wave display fills the bottom of the screen, with the upper part of the Home screen and its F buttons still visible.
3. To close the wave display, hold down SHIFT and press F5•WAVE DISP again—the lower portion of the Home screen reappears.



The wave display provides a highly magnified view of a track's audio in which you can often literally see the audio event you're looking for. The waveform in the display is the track's audio interpreted in graph form. The graph's vertical axis represents volume, or "amplitude." Its horizontal axis represents project time.



Here's how to get around on the wave display.

To:	*Do this:*
view the desired track	Use the ▼ and ▲ buttons.
zoom in or out vertically	Hold down SHIFT and press ▲ or ▼, respectively
zoom in or out horizontally	Hold down SHIFT and press ▶ or ◀, respectively

The track that's currently selected for editing remains selected as you scroll through—and view—different tracks in the wave display. You can see the name of the currently selected track in the top left corner of the display, a portion of the Home screen that's still visible. The wave display itself tells you which track you're viewing there.

By combining different vertical and horizontal zoom settings, you can view the selected track's audio with almost any degree of detail. You can also hold down SHIFT and press HOME•DISPLAY to toggle on and off a full-screen view of the wave display.

You can move through the project while you're on the wave display using the current time location display (Page 122)—which is still visible above the wave display—the transport buttons, position bar, Jump feature, locators or markers.

The wave display has its own position bar located beneath the displayed waveform. You can drag its handle with your mouse to move through the project. You can also click on the arrow at its left end to move slowly backward through the project—in steps of about 16 samples—or on the arrow at its right to move slowly forward.

Choosing the Right Editing Screen

Use the screen that best suits the job at hand:

- If you need to see the project's other tracks, or to see an entire project section at once, edit in the Home screen's playlist (Page 118). The Home screen is best suited to making larger edits: moving audio around in a project, or from track to track and so on. You'll find a variety of views and magnifications, as described on Page 119.

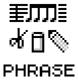
On the Home screen, you can jump from the start to the end of a selected track's phrases, one after another, by pressing PHRASE NEXT when the PREVIOUS/Next Sw (Page 356) is set to PHRASE. Press PHRASE PREVIOUS to move in the opposite direction.

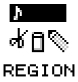
- Use the wave display when you need an up-close, detailed view of a track's audio. It's the best choice when precision is critical and when you're performing edits on tiny bits of audio. The wave display's especially handy when you're using Scrub (Page 178) to pinpoint audio events.

You can switch back and forth between the Home and wave display screens—and use different views and magnifications—as you edit.

Selecting Phrase or Region Editing

1. Hold down SHIFT and press F2•TRACK.
2. Select the desired type of editing by pressing F6. When:
   - *F6 is set to Ph→Reg*—phrase editing is currently selected, as shown by the onscreen symbol. You can press F6 (Ph→Reg) to switch to region editing.
   - *F6 is set to Reg→Ph*—region editing is currently selected, as shown by the onscreen symbol. You can press F6 (Reg→Ph) to switch to phrase editing.





If you're working on a VGA, you can click the PHRASE/REGION/AUTOMIX button at the right above the playlist on the Home screen to select the desired type of editing.

Editing Methods

The VS-2400CD lets you edit a project's phrase and regions two different ways:

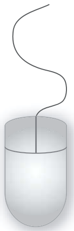
- mouse
- TRACK menu

You can use either of these methods exclusively, or any combination of them. You can perform many of the same phrase or region editing operations regardless of the method you decide to use, though each method presents your options a bit differently.

The mouse provides fast access to seven of the most common phrase editing operations and region operations. The TRACK menu offers additional editing operations as well.

What Each Editing Method Offers

Your Mouse

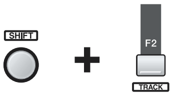


Mouse editing provides a fast, tactile editing experience. When you edit with a mouse, you can select phrases or regions by clicking and dragging. You can move them by simply dragging them to the desired locations, or copy them as you drag—a set of placement cursors help you position moved or copied phrases and regions where you wish them to go.

When you want to perform other editing related operations, a right-click of the mouse on the playlist opens the Edit Pop-Up menu—when you select an operation from the pop-up, an edit message appears (see below) in which you can use your mouse to set up the details of the edit and then execute it.

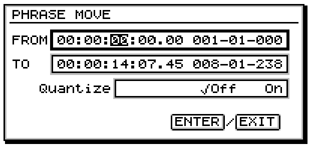
The TRACK Menu

To display the TRACK menu, press:



The TRACK menu offers parameter-based editing. When you select an edit operation from the TRACK menu, use the VS-2400CD's controls to select the desired phrases or regions, set the relevant parameters and then execute the operation. This form of editing allows you to edit slowly and carefully. The TRACK menu also provides access to some editing operations that aren't available using the mouse.

Edit Messages



PHRASE MOVE

FROM 00:00:02:00.00 001-01-000

TO 00:00:14:07.45 008-01-238

Quantize √Off On

When you edit using your mouse, the VS-2400CD is set by default to display edit messages that let you refine and confirm your edit. The displayed parameters are also found in the TRACK menu operation.

All phrase editing operations—and thus the parameters you see in the edit messages and in the TRACK menu—are explained in Chapter 19. All of the region editing operations are described in Chapter 20.

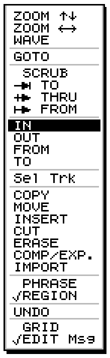
You can edit the displayed parameters with your mouse or the cursor buttons and Time/Value dial. An edit isn't executed until press ENTER/YES. To cancel the edit, press EXIT/NO.

You can turn edit messages off to speed up the editing process if you wish by resetting the UTILITY menu's EDIT MESSAGE parameter (Page 356). If you're using a mouse, you can turn the messages on and off in the Edit Pop-Up menu, described on Page 238.

Editing with a Mouse

The Edit Pop-Up Menu

The mouse works in conjunction with the Edit Pop-Up menu during phrase and region editing. You can set edit points from the menu—see Page 239—and perform quite a few other editing-related actions as described below.



In this illustration, the IN point is selected.

To view and use the Edit Pop-Up menu:

1. Right-click the mouse anywhere on the Home screen playlist or in the wave display—the Edit Pop-Up menu appears.
2. Scroll to the desired menu item. If the required edit points for an item in the menu haven't been set, the item is grayed-out.
3. Click the left mouse button.

To close the Edit Pop-Up menu without selecting an item, click on the playlist.

To:	*Right-click and:*
Zoom in or out	select ZOOM ↑↓ or ZOOM ↔. In either case, a dialog appears in which you can select the desired magnification.
View the wave display from the Home screen	select WAVE.
View the Home screen from the wave display	select P.LIST.
Move the now line to the position line's location	select GOTO.
Set IN, OUT, FROM and TO	see Page 239.
Activate the VS-2400CD's Scrub feature (Page 178)	select SCRUB and click to checkmark it.
Use Scrub to preview audio	select SCRUB TO to hear the audio just before the position line, SCRUB THRU to listen to audio just before and after the position line, or SCRUB FROM to listen to a small chunk of audio starting at the position line.
Select a track	Sel Trk selects the track on which you've right-clicked if no IN and OUT points have been set. (You can also select a track with your mouse by clicking on it. See Page 239).
Select a region	Sel Trk selects the region of data between the IN and OUT points on the track you've right-clicked if IN and OUT points have been set. (You can also select a region by dragging across it. See Page 241).
Select a phrase	Sel Phr selects the phrase you've right-clicked. (You can also select a phrase by clicking on it (Page 240) or from the SELECT PHRASE Pop-Up menu (Page 240).

To:	*Right-click and:*
Perform seven of the most common phrase or region editing operations (Page 244)	select the desired operation from the menu. You can select only those operations for which the required edit points have been set.
Switch from region to phrase editing and back	select PHRASE or REGION, as desired.
UNDO	select the desired Undo level from the Undo list (Page 71).
REDO	reverse the last Undo operation.
Activate snapping to a measures or beats grid	select GRID. Choose the desired grid from the dialog that appears to activate the grid.
Edit Msg	turn on (checked) or off edit messages that are displayed when you edit audio with your mouse. Edit messages are explained on Page 237.

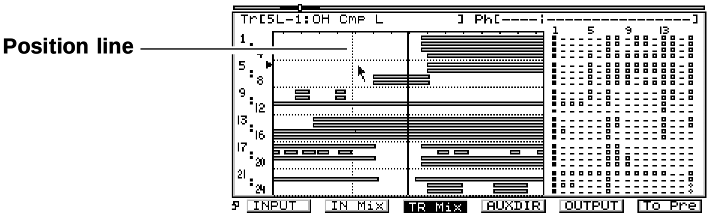
If you hold down CLEAR or SHIFT, additional options appear in the pop-up.

To:	*First:*	*Then right-click and:*
Clear region edit points	Press and hold CLEAR	select the desired edit point.
Move the now line	Press and hold SHIFT	select the desired edit point or choose GOTO to move to the current location of the position line.

Placing Edit Points with Your Mouse

To place an edit point with your mouse:

1. Click the mouse at the desired time location in the project. A dotted vertical line appears. This is called the "position line."



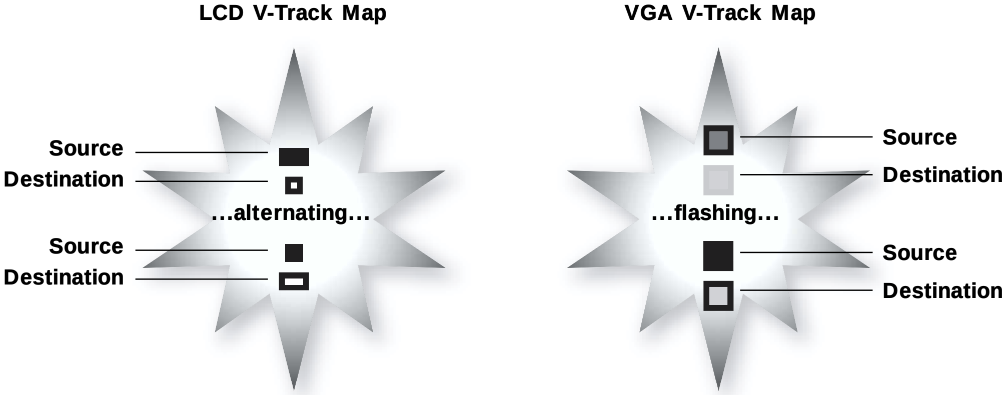
2. Click the right mouse button on the track playlist. The Edit Pop-Up menu appears and offers a variety of options.
3. Drag to the name of the desired edit point so that it's highlighted in the pop-up menu.
4. Click the left mouse button—the selected edit point is set. You can see its flag (Page 232) at the top of the position line above the playlist.

Selecting a Track with Your Mouse

To select a track with your mouse, click the track in the playlist, or click the track's number to the left of the playlist.

Selecting Destination V-Tracks with Your Mouse

When you're editing with your mouse, you can use the mouse and the LCD or VGA V-Track maps to quickly select destination V-Tracks for audio you're moving or copying. The V-Track maps show you the V-Tracks that act as the source of audio being moved or copied, as well as the currently selected destination V-Tracks.



On the LCD, a source V-Track's center is black. A destination V-Track's center is white.

On the VGA, a source V-Track's center is the track's color. A destination V-Track's center is amber and its outline is gray.

To change a new destination track's V-Track, click the desired V-Track with your mouse.

To learn how to change destination tracks—as opposed to V-Tracks— see Page 239.

Selecting Phrases By Clicking or Dragging Your Mouse

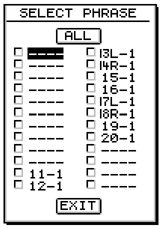
When phrase editing is selected (Page 236), you can select a phrase using the mouse by clicking on the desired phrase or dragging across it. In addition, you can drag vertically or diagonally across multiple tracks to select one phrase on each, or you can hold down SHIFT and click the phrase on each track you'd like to select. To unselect all selected phrases, click in an empty area of the playlist. To unselect one of a group of selected phrases, hold down SHIFT and click the phrase again.

When you drag with your mouse to select a phrase, make sure you start dragging on the playlist after the beginning of the project, Time 00h00m00s00f00.

If you click or drag across a phrase on a linked track, the phrase on the other linked track is also selected if there are phrases on both tracks at the location where the cursor first touches the phrase.

Selecting Phrases from the SELECT PHRASE Pop-Up Menu

To select one or more phrases using the SELECT PHRASE Pop-Up:



1. Select phrase editing in the TRACK menu (Page 236).
2. Turn the Time/Value dial to move the now line over the phrase(s).
3. Right-click any track number to the left of the playlist.
4. In the SELECT PHRASE Pop-Up menu, you can see which tracks contain a phrase at the now line's current position. Click each desired track to select its phrase. Click a track again to unselect its phrase.

Click ALL to checkmark all of the tracks, or click it again to un-check all of the tracks.

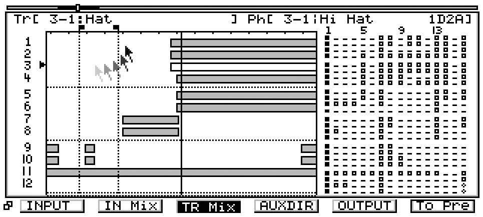
5. Click EXIT when you're done—the phrases you've selected are ready to be edited.

If you select a phrase on one of a pair of linked tracks, the phrase on the other linked track is also selected if it's touching the now line.

Selecting Regions by Dragging Your Mouse

When you drag with your mouse to select regions, make sure you start dragging on the playlist after the beginning of the project, Time 00h00m00s00f00.

1. Select region editing in the TRACK menu (Page 236).
2. Click and hold the left mouse button at the desired IN point, making sure to click after the start of the project.
3. Drag rightward across the display and release the button at the desired OUT point.



4. To re-do the operation, repeat Steps 2 and 3.

You can also drag from right to left, setting the OUT and then the IN and FROM points.

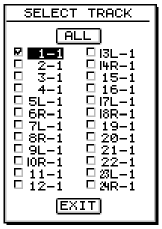
As you drag, any data that you drag across is also selected. To unselect any of this data, cursor to its track and press ENTER/YES.

The FROM point is placed at the start of the earliest data you select. You can move the FROM position manually using any method described late in this chapter.

If you select an audio region on one of a pair of linked tracks, the region on the other linked track is also selected.

Selecting Regions From the SELECT TRACK Pop-Up Menu

To select one or more regions using the SELECT TRACK pop-up:



1. Select region editing in the TRACK menu (Page 236).
2. Make sure your IN and OUT points are set as desired.
3. Right click on any track number to the left of the playlist—the SELECT TRACK Pop-Up menu appears.
4. Click each track that contains a region you want to select, or click the track again to unselect its region.

Click ALL to checkmark all of the tracks, or click it again to un-check all of the tracks.

5. Click EXIT when you're done—all audio that falls between the IN and OUT points on the selected tracks is now ready to be edited.

If you select a region on one of a pair of linked tracks, the region on the other linked track is also selected.

Moving Data by Dragging with Your Mouse

1. Activate phrase or region editing as desired (Page 236).
2. Select the desired phrase(s) or region(s).
   The FROM point is automatically placed at the front of the earliest data you select. Reset the FROM point to another location if you want to.
3. Move your mouse cursor over the desired data. The cursor changes to an opened hand to show that you can grab the data.
4. Click on the desired data and hold the mouse button down—the cursor changes to a closed hand to show the data is ready to be dragged.
   The TO point is automatically reset to the current position of the FROM point—you'll be setting a new TO location as you drag.
5. Drag the data to the desired location.
   You see the TO flag move as you drag, as well as a light gray copy of the data to show you where you're dragging it. Watch the closed hand for the appearance of any desired position cursors described on Page 244.
6. If edit messages—see "Edit Messages" on Page 237—are:
   - *turned off*—the data is moved to the new location, and you're done.
   - *turned on*—you can set the operation's parameters as desired and press ENTER/YES to proceed, or EXIT/NO to cancel the operation.

To learn how to snap dragged audio to a measures or beats, see "Snapping to Grid" on Page 243.

Copying Data by Dragging with Your Mouse

1. Activate phrase or region editing as desired (Page 236).
2. Select the desired phrase(s) or region(s).
   The FROM point is automatically placed at the front of the earliest data you select. Reset the FROM point to another location if you want to.
3. Move your mouse cursor over the desired data. The cursor changes to an opened hand to show that you can grab the data.
4. Click on the desired data and hold the mouse button down—the cursor changes to a closed hand to show the data is ready to be dragged.
   The TO point is automatically reset to the current position of the FROM point—you'll be setting a new TO location as you drag.
5. Hold down SHIFT—a plus sign appears in the closed-hand cursor icon.
6. While continuing to hold SHIFT, drag the data to the desired location.
   You see the TO flag move as you drag, as well as a light gray copy of the data to show you where you're dragging it. Watch the closed hand for the appearance of any desired position cursors described below.
7. Release the mouse button and then release SHIFT.
8. If edit messages—see "Edit Messages" on Page 237—are:
   - *turned off*—the data is moved to the new location, and you're done.
   - *turned on*—you can set the operation's parameters as desired and press ENTER/YES to proceed, or EXIT/NO to cancel the operation.

Using the Mouse To Trim the Front or Back of a Phrase

You can easily and quickly trim the front or back of a track phrase using your mouse—this serves the same purpose as the TRIM IN and TRIM OUT phrase editing operations (Page 253), though it's much faster. By simply dragging the phrase edge you want to trim, you can change where a phrase begins or ends.

1. Press HOME•DISPLAY and use the ◀, ▶, ▲ and/or ▼ buttons to set the display's magnification as desired.
2. To prepare to trim:
   - *the front of a phrase*—hold the mouse cursor over the phrase's leading edge until the trim in cursor appears.
   - *the back of a phrase*—hold the mouse cursor over the phrase's trailing edge until the trim out cursor appears.

+[+ — Trim in

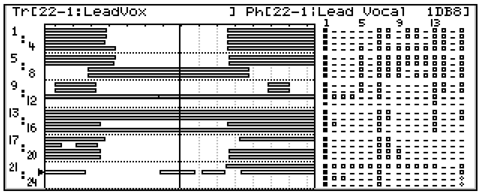
+]+ — Trim out

3. To trim:
   - *the front of the phrase*—click and drag to the right.
   - *the back of the phrase*—click and drag to the left.
4. Release the mouse button to execute the trim.

You can drag a phrase's edge as far as the beginning or end of the take on which the phrase is based, and no further.

Snapping to Grid

When you've set up a tempo map (Page 298) for your project, you can turn on the Home screen's Track Edit Grid feature.



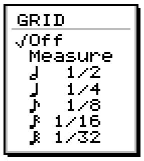
This illustration shows measure gridlines.

When the grid is active, the front edge of a phrase or region you're dragging "snaps" to the nearest gridline as you drag. You can have a gridline for every measure or beat. To place the audio at the gridline, release the mouse button after the snap. If you're dragging a group of phrase or regions, the first one you select snaps to the grid, and the others retain their positions relative to that first phrase or region.

To turn on the Track Edit Grid feature:

1. Right-click on the Home screen's playlist.
2. Select GRID from the Edit Pop-Up menu——the Grid Options window opens.
3. Select the desired grid setting. You can select:
   - *Off*—so the grid is turned off.
   - *Measure*—for a gridline at the start of every measure.
   - *Beat*—for a gridline for every beat in the project.
   - *1/2, 1/4, 1/8, 1/16, 1/32*—for a gridline at each selected beat division.

   If you select any value other than Off, the grid appears immediately in the playlist.



If you can't see the grid, hold down SHIFT and press ◀ or ▶ to zoom in or out until the gridlines appear.

You can snap any edit point to a gridline by setting the UTILITY Menu's GLOBAL GRID MODE parameter (Page 356) as desired. To:

- *snap only TO edit points to gridlines*—set GRID MODE to Only TO.
- *snap all edit points to gridlines*—set GRID MODE to ALL EDIT POINT.

You can temporarily disable the grid feature by holding down CLEAR on the VS-2400CD as you drag edit points or audio.

Position Cursors

As you drag phrases or regions in the playlist to move or copy them, watch the closed-hand cursor. It changes to help you place the moved or copied data precisely by showing you when the moving TO point (Page 232) is touching certain key locations:

When the closed hand turns to:	*The TO point is precisely placed at:*
	the original position of the front edge of the selected data if you haven't dragged up or down.
	the original position of the back edge of the selected data if you haven't dragged up or down.
	the IN point.
	the OUT point.
	the original FROM location.
	the now line.

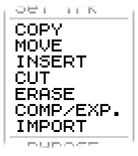
The position cursors are very precise, so watch the closed hand carefully. A position cursor lights only when the FROM point is precisely at one of the above locations. This, in fact, is what makes the position cursors so useful.

If the position cursors are appearing and disappearing too quickly for you to react, hold down SHIFT and press ▶ to zoom in on the playlist's time axis.

If you're moving audio and would prefer not to see the position cursors, hold down CLEAR as you drag. (The cursors are always visible when you're drag-copying audio.)

When you're editing phrases, you can place the IN and OUT points—otherwise unused in phrase editing—at locations where you think you may want to place dragged audio. Watch for the position cursors to show you when the TO point touches them.

Performing an Edit Operation From the Edit Pop-Up Menu



To perform seven of the most commonly used editing operations on selected phrases or regions from the Edit Pop-Up menu:

1. Select the desired operation from the Edit Pop-Up menu (Page 238). ENTER/YES flashes. If the desired operation is grayed out, make sure you've selected a phrase or region, and that all of the operation's required edit points are set.
2. Press ENTER/YES. If edit messages—see "Edit Messages" on Page 237—are:
   - *turned off*—the selected operation is performed, and you're done.
   - *turned on*—you can set the operation's parameters as desired and press ENTER/YES to proceed, or EXIT/NO to cancel the operation.

Editing from the TRACK Menu

You can perform any phrase or region editing operation from the TRACK menu. To display the TRACK menu:

SHIFT
+
F2
TRACK

1. Hold down SHIFT and press F2•TRACK.

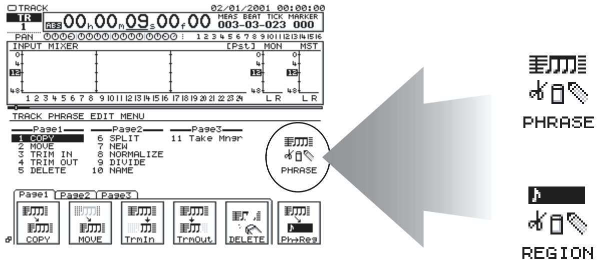
The parameters unique to each phrase or region editing operation are described in Chapters 19 and 20, respectively.

How the TRACK Menu Is Organized

The TRACK menu presents all phrase and region editing operations in two sub-menus:

- The TRACK PHRASE EDIT MENU
- The TRACK REGION EDIT MENU

The large PHRASE and REGION symbols that appear at the right side of the screen tell you at a glance which menu is currently displayed.


TRACK
02/01/2001 00:00:00
TR 1
ABS 00h00m09s00f00
MEAS BEAT TICK MARKER
003-03-023 000
PAN
INPUT MIXER
[Pst] MON MST
TRACK PHRASE EDIT MENU
Page1
1 COPY
2 MOVE
3 TRIM IN
4 TRIM OUT
5 DELETE
Page2
6 SPLIT
7 NEW
8 NORMALIZE
9 DIVIDE
10 NAME
Page3
11 Take Mngr
PHRASE
Page1 Page2 Page3
COPY
MOVE
TrmIn
TrmOut
DELETE
Ph→Reg
PHRASE
REGION

If you're viewing:	*Switch to the:*	*By pressing:*
TRACK PHRASE EDIT MENU	*TRACK REGION EDIT MENU*	F6 (Ph→Reg)
TRACK REGION EDIT MENU	*TRACK PHRASE EDIT MENU*	F6 (Reg→Ph)

You can also select the desired menu by pressing PHRASE•REGION•AUTOMIX on your connected VGA monitor until it turns green for phrase editing or red for region editing.

The Appearance of TRACK Menu Screens

TRACK menu screens, as shown above, don't fill the entire display—parts of the Home screen remain visible to make editing easier. You can move around a project using the current time location display (Page 122). The playlist is visible in most edit screens. The meters display—or the fader/pan displays—may also remain in view.

When the playlist is visible during editing, you can hold down SHIFT and press F5•WAVE DISP to replace the playlist with the wave display.

Sources and Destinations in the TRACK Menu

When you're moving or copying phrases and regions, or if you're swapping regions on different tracks in the TRACK menu, designate the:

- *source track*—the track you're moving or copying audio from.
- *destination V-Track*—the track to which you're moving or copying the audio.

Performing an Edit Operation from the TRACK Menu

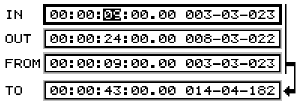
1. Hold down SHIFT and press F2•TRACK.
2. If the desired edit menu isn't displayed:
   - press F6 (Ph→Reg) to switch to the TRACK REGION EDIT MENU screen.
   - press F6 (Reg→Ph) to switch to the TRACK PHRASE EDIT MENU screen.
3. Begin the desired edit operation by:
   - *clicking its F button*—Each menu's available operations are arranged on a set of tabbed layers. If the desired operation's F button isn't visible, press PAGE until it appears, and then press its F button.
   - *selecting it from the displayed menu*—Use the cursor buttons to select the desired operation and press ENTER/YES.

   The operation's main screen appears. The TRACK STATUS buttons—and the SELECT buttons in some operations—flash. See Page 247 to learn about quick-selecting tracks, phrases and regions.

An operation may have more than one screen. For details on all of the phrase editing operations, see Chapter 19. Chapter 20 explains all of the region editing operations.

Placing Edit Points on a TRACK Menu Operation Screen

Each edit operation's main screen allows you to place the edit points the operation requires. They're presented as parameters. When you first begin an edit operation, the parameters show the time location of any edit point that's already been placed. You can set an edit point by:


IN 00:00:03:00.00 003-03-023
OUT 00:00:24:00.00 008-03-022
FROM 00:00:09:00.00 003-03-023
TO 00:00:43:00.00 014-04-182

- selecting its parameter and entering the desired location using the cursor buttons and Time/Value dial (or your mouse).
- selecting the edit point's parameter and moving the now line to the desired location. To lock in the new location, unselect the parameter by selecting some other parameter on the screen.
- using the current time location display to move the now line to the desired location, selecting the edit point's parameter and pressing F2 (GetNow).

You can move the now line to any already set edit point by selecting the edit point's parameter box and pressing F3 (GO TO).

About Selection in the TRACK Menu

The TRACK menu offers two ways to select tracks, phrases and regions. You can use the:

- *Quick-Selection feature*—that lets you quickly select the tracks you want to edit.
- *onscreen selection tools*—that provide more information about your selection, and let you select destination V-Tracks when you're copying, moving or exchanging audio.

When you're moving, copying or exchanging audio, you need to select source and destination tracks. In other edit operations, you need only select the phrase(s) or region(s) upon which you want to perform the operation.

Quick-Selecting from the TRACK Menu

You can use Quick Selection for all phrase and region operations except the phrase Take Manager, and the region IMPORT and ARRANGE edit operations.

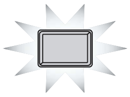
When you select and begin an editing operation that requires the selection of phrases or regions, the TRACK STATUS buttons—and sometimes the SELECT buttons—start to flash. You use these buttons to quick-select the tracks that contain the desired phrases or regions. When you select the track:

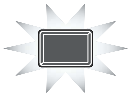
- any phrase on the track that's touching the now line is selected. If there's no phrase touching the now line, the track will not let itself be selected. Move the now line so it touches the desired phrase, and then select it.
- any region of audio on the track between the IN and OUT points is selected—see "Placing Edit Points on a TRACK Menu Operation Screen" on Page 246. If there's no audio on the track between the IN and OUT points, the track cannot be selected.

If you quick-select a phrase or region on one of a pair of linked tracks, the phrase or region on the other linked track is also quick-selected.

To quick-select source tracks and destination tracks when moving, copying or exchanging audio:

1. If necessary, press Tr 1-12 or TR 13-24 to display the track channels that include the track you want to select.
2. Press the SELECT button of a source track—it lights solidly in green to show that the audio comes from that track.
   By default, the same track is selected as the destination track. Its TRACK STATUS buttons light red to show this.
3. If you want to select a different destination track, press its TRACK STATUS button so it turns red.
4. To include another set of source and destination tracks, press the new source track's SELECT button.





Each time you select a new source track, subsequent destination track selections apply to that source—you can't go back and select a different destination track for a source you selected earlier.

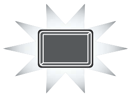
5. Press the new destination track's TRACK STATUS button.
6. To remove a set of source and destination tracks, press the source track's SELECT button—the source and destination tracks' SELECT and TRACK STATUS buttons flash to show they're no longer selected.

If you'd like to change an earlier set of source/destination tracks, press the source track's SELECT button, and then set it up again the way you want it.

The V-Track map on the display shows you the V-Tracks that are currently selected for editing. Any V-Track with a wide, flashing black box is a source. Any V-Track with a wide, flashing white box is a destination.

Quick Selection always select the destination track's currently active V-Track. To select a different destination V-Track, use the onscreen selection tools.

To quick-select phrase and regions for all other quick-selectable edit operations:



1. If necessary, press Tr 1-12 or TR 13-24 to display the track channels that include the track you want to select.
2. Press the desired track's TRACK STATUS button—it lights solid red to show it's targeted for editing.
3. Repeat Steps 1 and 2 for any other tracks you want to include.
4. To unselect a track, press its TRACK STATUS button again—it flashes green to show it's no longer selected.

The V-Track map on the display shows you which V-Tracks are currently selected for editing. Any V-Track with a flashing, wide white box is selected for editing.

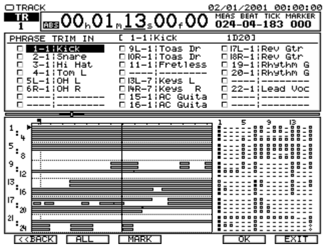
After you've selected the desired phrase(s) or regions(s), set up the rest of the edit operation on the display.

Selection Using the TRACK Menu's Onscreen Selection Tools

For most of the TRACK menu's editing operations, when you want to select a phrase or region using the TRACK menu onscreen selection tools, you press:

- *F1 (SelPhr)*—to select a phrase
- *F1 (SelTrk)*—to select a region

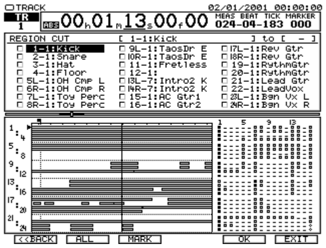
When you press F1 (SelPhr) or F1 (SelTrk), the phrase or region selection display appears in the upper part of the screen—just beneath the current time location display—while the playlist is visible in the lower part of the screen.



Phrase selection display

```
TRACK                                        02/01/2001 00:00:00
TR
 1   ABS 00h01m13s00f00          MEAS BEAT TICK MARKER
                                 024-04-183  000
PHRASE TRIM IN        [ 1-1¦Kick           1D20]
  ☐  1-1¦Kick      ☐ 9L-1¦Toas Dr    ☐17L-1¦Rev Gtr
  ☐  2-1¦Snare     ☐10R-1¦Toas Dr    ☐18R-1¦Rev Gtr
  ☐  3-1¦Hi Hat    ☐ 11-1¦Fretless   ☐ 19-1¦Rhythm G
  ☐  4-1¦Tom L     ☐ ----¦---------  ☐ 20-1¦Rhythm G
  ☐ 5L-1¦OH L      ☐13L-7¦Keys L     ☐ ----¦---------
  ☐ 6R-1¦OH R      ☐14R-7¦Keys  R    ☐ 22-1¦Lead Voc
  ☐ ----¦--------- ☐ 15-1¦AC Guita   ☐ ----¦---------
  ☐ ----¦--------- ☐ 16-1¦AC Guita   ☐ ----¦---------
```

You can select tracks that have a phrase touching the now line.



Region selection display

```
TRACK                                        02/01/2001 00:00:00
TR
 1   ABS 00h01m13s00f00          MEAS BEAT TICK MARKER
                                 024-04-183  000
REGION CUT            [ 1-1:Kick                ] to [   - ]
  ☐  1-1:Kick      ☐ 9L-1:TaosDr E   ☐17L-1:Rev Gtr
  ☐  2-1:Snare     ☐10R-1:TaosDr E   ☐18R-1:Rev Gtr
  ☐  3-1:Hat       ☐ 11-1:Fretless   ☐ 19-1:RythmGtr
  ☐  4-1:Floor     ☐ 12-1:           ☐ 20-1:RythmGtr
  ☐ 5L-1:OH Cmp L  ☐13L-7:Intro2 K   ☐ 21-1:Lead Gtr
  ☐ 6R-1:OH Cmp R  ☐14R-7:Intro2 K   ☐ 22-1:LeadVox
  ☐ 7L-1:Toy Perc  ☐ 15-1:AC Gtr1    ☐23L-1:Bgn Vx L
  ☐ 8R-1:Toy Perc  ☐ 16-1:AC Gtr2    ☐24R-1:Bgn Vx R
```

You can select any track—whether it contains audio in the defined region or not—since regions can contain silence.

When you're performing phrase deletion, normalization or naming, or region exchanging or naming, there's no need to press F1—the desired selection display appears on the edit operation's main screen.

There are no phrase or region selection displays for creating a new phrase, importing a region from another project or re-arranging the order of regions in a project.

If you select a phrase or region on one of a pair of linked tracks, the phrase—if it's touching the now line—or region on the other linked track is also selected.

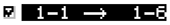
To select a phrase or region using the TRACK menu's onscreen tools:

1. Use the cursor buttons to select the track containing the desired phrase or region.
2. Press F3 (MARK) to select the track's phrase or region—a checkmark appears to the track's left to show it's selected.

☑ 1-1:Kick

When you're selecting phrases, only tracks containing a phrase that's touching the now line can be marked. You can mark additional phrases on the other tracks by cursoring up to the current time location display and turning the Time/Value dial to move the now line to the desired phrases. You can then mark their tracks.

3. To unselect a track, press F3 (MARK) again—the checkmark is removed. If the editing operation involves moving or copying audio between tracks, you see an arrow to the right of the track you've selected. This arrow points to a destination V-Track.



On many editing screens, you can see each track's name. On selection screens that allow you to choose V-Tracks, only track numbers are shown to make room.

4. Turn the Time/Value dial to select the desired destination V-Track.

Be careful not to select the same V-Track as a destination for more than one source.

You can use the onscreen tools together with the Quick Selection feature to jump from one track's currently selected V-Track to another track's currently selected V-Track without having to turn the Time/Value dial to get there. While the source track is highlighted onscreen, you can press any track's TRACK STATUS button to make the onscreen V-Track value jump to that track's currently selected V-Track.

5. Repeat Steps 1-4 for any phrase or region you wish to select.
6. Press F1 (<<BACK) to return to the edit operation's main screen, or F6 (EXIT) to return to the TRACK PHRASE EDIT MENU or the TRACK REGION EDIT MENU.

You can select or unselect all of the displayed phrase or regions at once by pressing F2 (ALL). If any phrase or regions are selected, they become unselected. If none are selected, they all become selected. If they're all selected, they all become unselected. Press F2 (ALL) repeatedly to toggle selection on and off for all phrases or regions.

19—Phrase Editing Operations

This chapter describes the phrase-based editing operations you can perform in the VS-2400CD. Most of the operations can be performed using a mouse or the edit commands presented in the TRACK menu. Some can be performed only from the TRACK menu. We'll list the way(s) each operation can be performed.

Chapter 18, "Editing Tracks," explains:

- important editing concepts you need to know—see Page 231.
- all about the FROM and TO edit points—see Page 232.
- how to edit using a mouse—see Page 238.
- how to edit from the TRACK menu—see Page 245.

You can find step-by-step editing instructions in the Step-by-Step Instruction Finder that starts on Page 21.

When copying or moving phrases, or creating a new phrase, don't mix project recording modes. If your project uses a recording mode other than CDR, and you've recorded mastering tracks (Page 330) in CDR mode, their phrases can't be used on other project V-Tracks. Likewise, non-CDR phrases can't be used on CDR-recorded V-Tracks. If you attempt either action, the VS-2400CD displays "Found Illegal Track Pair!" Press ENTER/YES. You can easily spot CDR-recorded tracks—see Page 331.

COPY

Use: Mouse, TRACK menu

TRACK menu
F1 (COPY)

Phrase COPY makes a copy of each selected phrase and pastes the copy at the desired location. You can copy a phrase to a new time location and/or to another track. You can copy it to a currently selected V-Track, or to a V-Track that isn't currently selected.

The TRACK menu's phrase COPY operation lets you copy phrases to V-Tracks that aren't currently selected.

Why You'd Use Phrase COPY

You can use COPY to build a track from a short musical segment such as a drum pattern. By pasting the pattern end-to-end the desired number of times, you can create a seamless drum loop. COPY also allows you re-use performances that occur multiple times in a project—perfectly performed chorus background vocals, for example. You can also create a safety copy of a phrase on a spare V-Track before editing the original.

Edit Points

- *FROM*—sets the location of the phrase's time anchor.
- *TO*—sets the time location at which you want to paste the time anchor.

Times

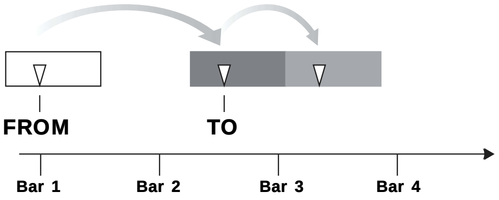
This sets the number of copies to be pasted, one after another, at the TO point.

Quantize

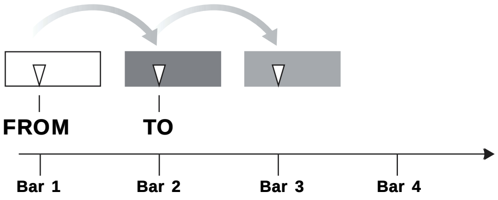
When Times is set to a number other than 1, Quantize lets you paste the copied phrases precisely on the first beat of the tempo map's measures. You can set Quantize to:

- *Off*—so that copies are pasted according to the Overlap setting described below.
- *On*—so that the TO point for the first copy is shifted to the first beat of the measure in which TO is currently placed. Each subsequent copy is pasted the same number of measures away from the FROM point, at the first beat of the measure.

With Quantize off



With Quantize on



This allows you to keep pasted copies in time no matter what the tempo of the audio in the project is, even if it speeds up or slows down.

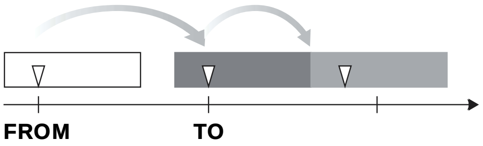
To take advantage of the Quantize feature, you'll need to established a tempo map for your project. See Page 298.

Overlap

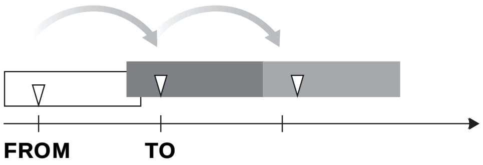
When the Times parameter is set to a number other than 1, the Overlap parameter sets the timing relationship between pasted copies. When Overlap is:

- *Off*—the front of each copied phrase is pasted to the end of the preceding copy. The copied phrases' timing can grow more and more incorrect with each copy.

When the phrase is shorter than the distance between FROM and TO.

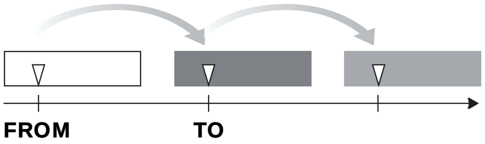


When the phrase is longer than the distance between FROM and TO.

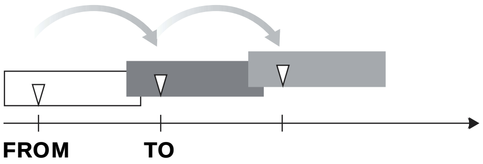


- *On*—each copy is pasted at the same time distance from the start of the previous copy as the distance between FROM and TO. If the length of the phrase is different than the distance between FROM and TO, Overlap keeps the pasted copies in time.

When the phrase is shorter than the distance between FROM and TO.



When the phrase is longer than the distance between FROM and TO.



MOVE

Use: Mouse, TRACK menu

Phrase MOVE lets you place a selected phrase at a new time location and/or on another track. You can move it to a currently selected V-Track, or to a V-Track that isn't currently selected.

TRACK menu
F2 (MOVE)

The TRACK menu's phrase MOVE operation lets you move phrases to V-Tracks that aren't currently selected.

Why You'd Use Phrase MOVE

If there's a timing error in a performance, MOVE can shift it into correct musical time. You can also move a performance from one spot in a project to a more useful location—for example, if a guitarist plays a great lick at the end of your fadeout, you can move the lick into the project's intro, or into the solo section in the middle of the project.

Edit Points

- *FROM*—sets the location of the phrase's time anchor.
- *TO*—sets the time location to which you want to move the time anchor.

Quantize

Quantize lets you move a phrase exactly to the first beat of a measure when you've set up a tempo map for your project (see Page 298). Set it to:

- *Off*—so that the phrase is moved to the TO location.
- *On*—so that the phrase is moved to the first beat of the measure in which TO is currently placed.

Quantizing works when you're moving a phrase much the way it works when you're copying multiple phrases, as illustrated on Page 252.

TRIM IN

Use: Mouse, TRACK menu

TRIM IN allows you to adjust the location at which a selected phrase begins without changing the timing of its audio content.

TRACK menu
F3 (TrmIn)

Why You'd Use Phrase TRIM IN

You can use TRIM IN to make a phrase start exactly where its audio begins by cleaning off unwanted silence or noise from its beginning. This can make it easier to move or copy the phrase. Use TRIM IN to clean up the front of your mastering tracks (Page 336).

Edit Points

- *TO*—sets the desired beginning of the phrase. Any part of the phrase that occurs before the TO point is trimmed from the phrase.

You can also trim the front of a phrase using your mouse—see Page 242.

TRIM OUT

Use: Mouse, TRACK menu

TRIM OUT allows you to adjust the location at which a selected phrase ends without changing the timing of its audio content.

TRACK menu F4 (TrmOut)

Why You’d Use Phrase TRIM OUT

Use TRIM OUT to remove unwanted audio from the end of a phrase. You can also use TRIM OUT to get rid of unwanted studio noise and conversation after the audio you want to keep. Use TRIM OUT to clean up the ends of your mastering tracks (Page 336).

You can use TRIM OUT when you need to trim a rhythm pattern to exactly the right length to help ensure that it loops properly.

Edit Points

- *TO*—sets the desired end of the phrase. Any part of the phrase that occurs after the TO point is trimmed from the phrase.

You can also trim the front of a phrase using your mouse—see Page 242.

DELETE

Use: Mouse, TRACK menu

Use the phrase DELETE command to remove a phrase from a project.

TRACK menu F5 (DELETE)

Remember: When you delete a phrase from a project, you’re not erasing its audio from your hard drive unless you optimize the project (Page 96). If you haven’t optimized the project, you can get the audio back at any time using Undo or by creating a new phrase (Page 255) from the take on which the phrase was based.

Why You’d Use Phrase DELETE

Phrase DELETE allows you to get rid of unwanted phrases so you don’t have to bother silencing them when you mix, and so they don’t clutter up your playlist.

SPLIT

Use: Mouse, TRACK menu

You can split a currently selected phrase into two phrases using the phrase SPLIT command.

TRACK menu F1 (SPLIT)

Why You’d Use Phrase SPLIT

Phrase SPLIT lets you break up longer phrases into two separate pieces to turn musical ideas, sound effects or anything else into individual objects. This makes it easier to move each element, copy it, or subject it to any other editing operation.

If you plan to be moving a lot of audio around in a project, taking the time to split your elements into separate phrases can make editing much easier in the long run. DIVIDE can break up a long phrase into multiple components automatically—see Page 256.

Edit Points

TO—sets the point at which a selected phrase is split.

Here's an easy way to set the SPLIT TO point: move the now line to the desired location and press F2 (GetNow).

NEW

Use: Mouse, TRACK menu

You can create a new phrase from any of the project's takes stored on your hard drive—to learn about takes, see Page 84.

TRACK menu
F2 (NEW)

Why You'd Use Phrase NEW

Phrase NEW lets you retrieve a project recording that you've discarded. This recording can be a phrase you've deleted, or a performance that you originally thought you didn't want to use. If you've deleted a portion of a phrase that you want to restore—and can't remember its Undo level—you can go back to the take on which the phrase is based, and make a whole new phrase you can re-edit.

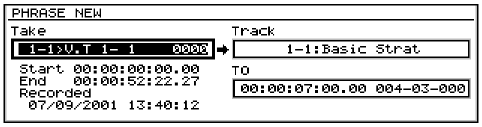
Edit Points

- *TO*—sets the time location at which the start of the new phrase is placed.

If you'd like the new phrase to be created at the same location in the project at which the take was originally recorded, press F4 (Orignl).

Take

Highlight the Take parameter and turn the Time/Value dial to scroll through all of the project's available takes to select the one you want. Beneath the Take parameter you can see information about the selected take, including the location in the project where recording began and ended, and when the take was recorded.



```
PHRASE NEW
Take                              Track
 1-1>V.T 1- 1     0000  →        1-1:Basic Strat
 Start 00:00:00:00.00             TO
 End   00:00:52:22.27             00:00:07:00.00 004-03-000
 Recorded
  07/09/2001 13:40:12
```

Press F1 (TAKE) to jump to the Take Manager (Page 259). In the Take Manager, you can preview takes. To leave the Take Manager and resume editing, press F1 (<<BACK).

If you've already optimized the project, unused takes recorded before optimization will have been erased from the hard drive.

If you attempt to use a CDR-recorded take on a V-Track recorded in another mode—or vice versa—the VS-2400CD displays "Found Illegal Track Pair!" Press ENTER/YES to continue, and select a non-CDR take. You can identify a CDR-recorded take by the asterisk in its number, as shown on Page 331.

Track

Turn the Time/Value dial to select any V-Track in the project as the V-Track on which the new phrase is to be created.

You can quick-select any currently active V-Track as a destination for the new phrase by selecting its track—press the track's TRACK STATUS button so it lights solidly.

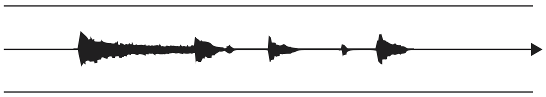
NORMALIZE

Use: TRACK menu

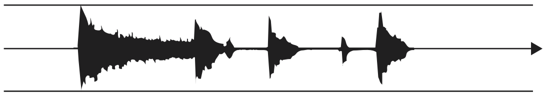
TRACK menu
F3 (Normlz)

Normalization raises the level of a phrase to its optimal volume.

Before normalization



After normalization



The main NORMALIZE screen provides a phrase selection display in which you can mark the phrase you want to normalize. If the phrase you want isn't available, move the now line so that it touches the phrase.

Why You'd Use Phrase NORMALIZE

Phrase NORMALIZE allows you to increase the level of a phrase that was recorded at too low a volume to give you more signal to work with during bouncing and/or mixing.

While NORMALIZE can help a weak recording level, it's not a perfect substitute for recording the signal properly in the first place since it raises the volume of background noise along with the desired audio content in the phrase.

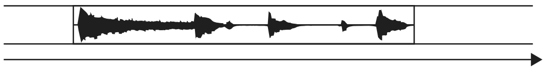
DIVIDE

Use: TRACK menu

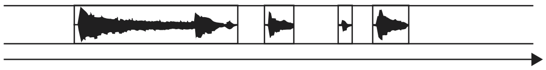
TRACK menu
F4 (DIVIDE)

Phrase DIVIDE analyzes the level of the signal in the phrase and automatically divides it into smaller phrases wherever the signal level falls below a specified volume.

Phrase DIVIDE analyzes the levels in the original phrase…



…and divides the phrase up into smaller phrases.



Why You'd Use Phrase DIVIDE

Phrase DIVIDE breaks up a longer phrase into smaller phrases so that you can more easily work with the elements of a recording on an individual basis. It seeks to achieve the same result as phrase SPLIT (Page 254), but it does so automatically, and by working with an entire phrase in a single editing operation.

IN Threshold

The IN Threshold sets the level at which a new phrase begins. As the VS-2400CD searches for its next phrase, it considers a level higher than the IN Threshold parameter's value to signify the start of a new phrase. IN Threshold can be set from -84 dB to -6 dB.

In Margin

The VS-2400CD adds the amount of time selected by the IN Margin parameter to the front of a newly created phrase to ensure that the phrase doesn't start too abruptly in the middle of a signal on its way up to the IN Threshold level.

OUT Threshold

OUT Threshold sets the level at which a phrase ends. When a phrase's signal falls below the level set by the OUT Threshold parameter, the VS-2400CD considers the current phrase to be complete, and starts searching for the next phrase. OUT Threshold can be set from -84 dB to -6 dB.

OUT Margin

The VS-2400CD adds the amount of time selected by the OUT Margin parameter to the end of a newly created phrase to ensure that its audio isn't cut off prematurely as its signal drops down in level below the OUT Threshold.

NAME

Use: TRACK menu

You can name any phrase. The main NAME screen provides a phrase selection display in which you can select the desired phrase. If the phrase you want isn't available in the display, move the now line so that it touches the phrase and press F1 (NAME). To learn about the VS-2400CD's naming tools, see "Naming" on Page 71.

TRACK menu
F5 (NAME)

Why You'd Use Phrase NAME

When you name a phrase, it becomes easier to identify in the playlist and when you're selecting phrases during editing.

PARAMETER

Use: TRACK menu

TRACK menu
F1 (PARAM)

The phrase PARAMETER phrase editing screen allows you to independently set the level of each phrase on a track, and/or set it to fade in and/or out.

Why You'd Use Phrase PARAMETER

You can smooth out any volume variations during recording, punching or editing by adjusting the volumes of individual phrases. You can use the phrase fade-in and -out tools to control the way that any phrase starts or ends.

PHRASE LEVEL

PHRASE LEVEL sets the volume of a phrase. You can boost its level by as much as 6 db, or cut its level down to -∞. At 0 db, the phrase plays at its original recorded level.

If FADE IN TIME or FADE OUT TIME is set to less than 0.02 seconds, you may hear a short "blip" during playback. If this occurs, lengthen the time setting.

FADE IN TIME, FADE OUT TIME

FADE IN TIME allows you to set the time over which the phrase's volume goes from silence to its selected level at the start of the phrase. FADE OUT TIME allows you to set the length of time it takes the phrase's volume to go from its selected level to silence at the end of the phrase.

FADE IN CURVE, FADE OUT CURVE

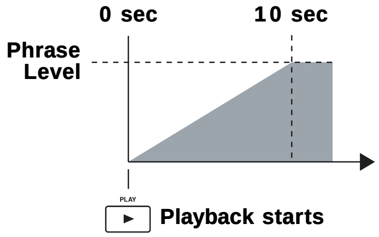
You can set how the phrase's level changes during a fade by setting the corresponding fade curve parameter. You can set FADE IN CURVE and/or FADE OUT CURVE to:

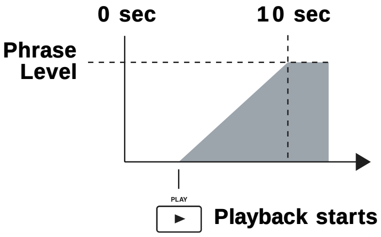
- *Linear*—so the fade volume changes at the same rate over the course of the fade.
- *Exp*—so that the fade volume changes exponentially.

About Fade-Ins and Fade-Outs

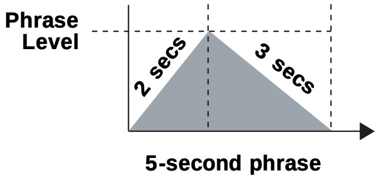
Here are some things to consider as you set up a phrase fade-in or fadeout:

- *If you start playback of a phrase in the middle of a fade-in*—the fade length is shortened so that it still ends at the desired time, resulting in an faster fade-in.



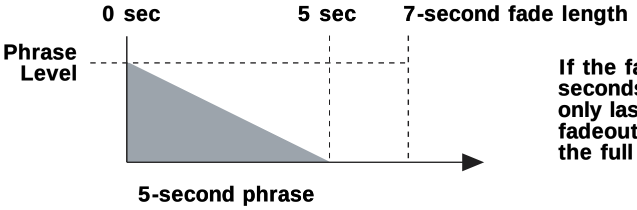


- *If the FADE IN TIME and FADE OUT TIME together are longer than the phrase*—the FADE OUT TIME is given priority and the FADE IN TIME is shortened accordingly.



If the fade-in and fadeout are both set to three seconds, the fadeout lasts for its full three seconds and the fade-in is shortened to the remaining two seconds.

- *If the FADE OUT TIME is longer than the phrase*—it's automatically shortened to equal the actual length of the phrase.



If the fadeout is seven seconds long, but the phrase only lasts five seconds, the fadeout acts as if it's set to run the full length of the phrase.

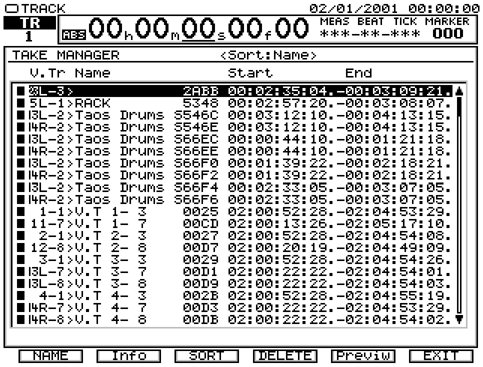
Take Mngr

Use: TRACK menu

TRACK menu F1 (TAKE)

The Take Mngr ("Take Manager") shows you all of the project's takes currently on your hard drive.

A black box to the left of a take means that it's used by a phrase in the project.



```
TRACK                                    02/01/2001 00:00:00
 TR                                     MEAS BEAT TICK MARKER
  1   ABS 00h00m00s00f00                ***-**-***     000
TAKE MANAGER              <Sort:Name>
   V.Tr Name                  Start          End
■ %L-3>                  2ABB 00:02:35:04.-00:03:09:21.
■ 5L-1>RACK              5348 00:02:57:20.-00:03:08:07.
■13L-2>Taos Drums       S546C 00:03:12:10.-00:04:13:15.
■14R-2>Taos Drums       S546E 00:03:12:10.-00:04:13:15.
■13L-2>Taos Drums       S66EC 00:00:44:10.-00:01:21:18.
■14R-2>Taos Drums       S66EE 00:00:44:10.-00:01:21:18.
■13L-2>Taos Drums       S66F0 00:01:39:22.-00:02:18:21.
■14R-2>Taos Drums       S66F2 00:01:39:22.-00:02:18:21.
■13L-2>Taos Drums       S66F4 00:02:33:05.-00:03:07:05.
■14R-2>Taos Drums       S66F6 00:02:33:05.-00:03:07:05.
■  1-1>V.T 1- 3          0025 02:00:52:28.-02:04:53:29.
■ 11-7>V.T 1- 7          00CD 02:00:13:26.-02:05:17:10.
■  2-1>V.T 2- 3          0027 02:00:52:28.-02:04:54:08.
■ 12-8>V.T 2- 8          00D7 02:00:20:19.-02:04:49:09.
■  3-1>V.T 3- 3          0029 02:00:52:28.-02:04:54:26.
■13L-7>V.T 3- 7          00D1 02:00:22:22.-02:04:54:01.
■13L-8>V.T 3- 8          00D9 02:00:22:22.-02:04:54:03.
■  4-1>V.T 4- 3          002B 02:00:52:28.-02:04:55:19.
■14R-7>V.T 4- 7          00D3 02:00:22:22.-02:04:53:29.
■14R-8>V.T 4- 8          00DB 02:00:22:22.-02:04:54:02.
```

The numbers and letters to the right of a take's name are its hexadecimal file identification.

If you're not sure what a take is, see Page 84.

You can do a variety of things with the takes you see in the Take Manager screen—use the ▼ and ▲ buttons or the Time/Value dial to scroll through the list. Press:

- *F1 (NAME)*—to rename the selected take in order to make it easier to identify. For more on naming, see Page 71.
- *F2 (INFO)*—to toggle the information shown for the takes. The Take Manager can show each take's size and session information, or its start and end time.
- *F3 (SORT)*—to switch among the list's available sorting orders. You can select:
  - *Hist*—to sort the list by recording date and time.
  - *V.Tr*—to sort the list in V-Track order.
  - *Name*—to sort the list alphabetically by name.
- *F4 (DELETE)*—to delete the currently selected take.

When you delete a take, it's permanently erased from your hard drive. Use this feature cautiously. It cannot be undone.

- *F5 (Previw)*—to listen to the selected take. Press EXIT/NO to halt playback.
- F6 (EXIT)—to return to the TRACK PHRASE EDIT MENU.

20—Region Editing Operations

This chapter explains the editing operations you can perform on project regions. Since region editing operations work on a chunk of time within a track, you can think of them as track editing operations—some of them do, in fact, affect an entire track.

You can perform most region operations using a mouse or the edit commands presented in the TRACK menu. Some are available only in the TRACK menu. We'll list how each operation can be performed in its description.

Chapter 18, "Editing Tracks," explains:

- important editing concepts you need to know—see Page 231.
- all about the FROM and TO edit points—see Page 232.
- how to edit using a mouse—see Page 238.
- how to edit from the TRACK menu—see Page 245.

You can find step-by-step editing instructions in the Step-by-Step Instruction Finder that starts on Page 21.

About Tracks Recorded with the CDR Recording Mode

When moving audio between tracks, take care not to mix project recording modes. If your project uses a recording mode other than CDR, and you've recorded mastering tracks (Page 330) using CDR mode, their audio can't be used on other project V-Tracks. Likewise, non-CDR audio can't be used on CDR-recorded V-Tracks. If you attempt either action, the VS-2400CD displays "Found Illegal Track Pair!" and the operation will not proceed. Press ENTER/YES to resume editing. You can easily spot CDR-recorded tracks by their appearance—see Page 331.

COPY

Use: Mouse, TRACK menu

With region COPY, you can copy an audio region in a selected track and paste the copy at a new location. You can copy a region to a new time location and/or to another track. You can copy it to a currently selected V-Track, or to a V-Track that isn't currently selected.

TRACK menu
F1 (COPY)

The TRACK menu's region COPY operation lets you copy phrases to V-Tracks that aren't currently selected.

Why You'd Use Region COPY

You can use COPY to build a track from a short musical segment such as a rhythm pattern. By pasting the pattern end-to-end the desired number of times, you can create a seamless drum loop. COPY also allows you re-use performances that occur multiple times in a project, such as perfectly performed chorus background vocals. You can also create a safety copy of a track's audio on a spare V-Track before editing the original.

Edit Points

- *IN*—sets the beginning of the audio region to be copied.
- *OUT*—sets the end of the audio region to be copied.
- *FROM*—sets the location of the region's time anchor.
- *TO*—sets the time location at which you want to paste the time anchor.

Be sure to set the distance between IN and OUT to a length of time greater than .5 seconds. Regions smaller than that will be copied, but won't properly play back.

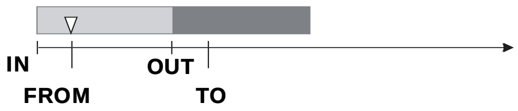
Times

This parameter sets the number of copies to be pasted, one after another, at the TO point.

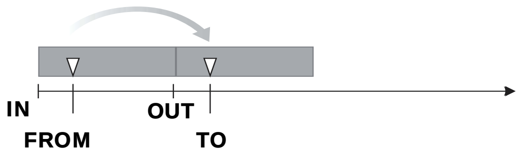
+Insert

The +Insert parameter lets you choose whether you want the copied region to be pasted over any audio already at the TO location, or inserted before it.

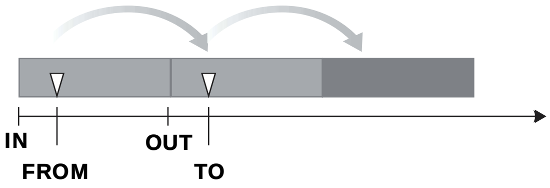
Before COPY



COPY with +Insert off



COPY with +Insert On



Set it to:

- *Off*—so that the copied audio is pasted over any audio already present at the destination location.
- *On*—so that the copied audio is inserted at the TO point, moving all subsequent audio on the track to the end of the pasted copy, or copies.

MOVE

Use: Mouse, TRACK menu

TRACK menu
F2 (MOVE)

The region MOVE edit operation moves the selected audio to a new location. You can move a region to a new time location and/or to another track. You can move it to a currently selected V-Track, or to a V-Track that isn't currently selected.

The TRACK menu's region MOVE operation lets you move phrases to V-Tracks that aren't currently selected.

Why You'd Use Region MOVE

Region MOVE is a great way to move a segment of audio to a more useful location in a project.

Edit Points

- *IN*—sets the beginning of the audio region to be moved.
- *OUT*—sets the end of the audio region to be moved.
- *FROM*—sets the location of the region's time anchor.
- *TO*—sets the time location to which you want to move the time anchor.

Be sure to set the distance between IN and OUT to a length of time greater than .5 seconds. Regions smaller than that will be moved, but won't properly play back.

+Insert

The +Insert parameter for region MOVE works the same way as region COPY's +Insert parameter—see Page 262. Set it to:

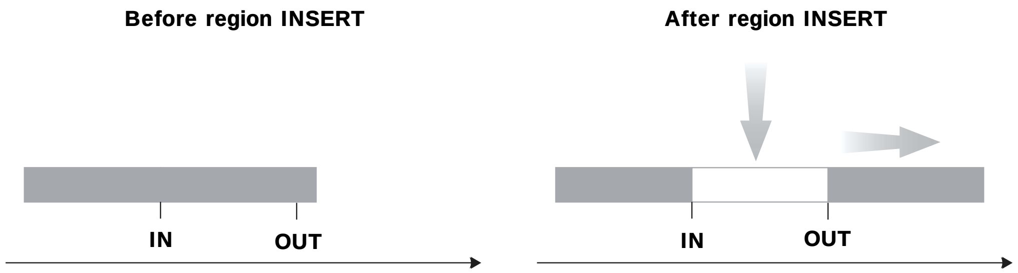
- *Off*—so that the region you're moving replaces any audio already present at the destination location.
- *On*—so that the region you're moving is inserted at the TO point, moving all subsequent audio on the track to the end of the moved region.

INSERT

Use: Mouse, TRACK menu

TRACK menu
F3 (INSERT)

The INSERT edit operation adds silent, blank space between the designated IN and OUT points. Audio that had previously been there—and all of the audio that comes after it—is slid back to the OUT point, thus lengthening the track due to the added blank space.


Before region INSERT
After region INSERT

Why You’d Use Region INSERT

You’d use region INSERT if you wanted to shift audio to a later time in the project, leaving empty sonic space before it.

You can use INSERT to add a pause between sections of a musical piece by inserting the same amount of blank time into all of the project’s tracks.

Edit Points

- *IN*—sets beginning of the blank space you’re inserting.
- *OUT*—sets the end of the blank space you’re inserting.

Make sure there’s no audio within .5 seconds before the IN point and .5 seconds after the OUT point to ensure a smooth transition.

AllVTr

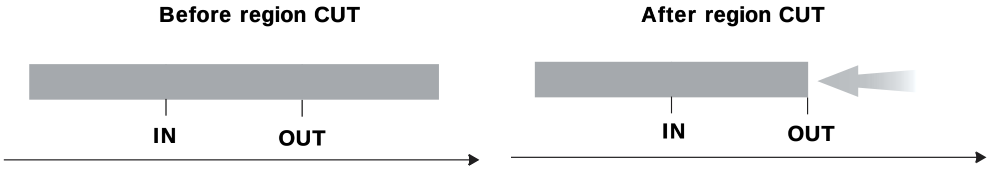
Turn AllVTr on if you want to insert the blank space into all of the V-Tracks belonging to a selected track—this will keep all of the V-Tracks aligned if you’re separating entire sections of a project by inserting blank space.

CUT

Use: Mouse, TRACK menu

TRACK menu
F4 (CUT)

Region CUT removes a specified chunk out of the selected track, moving everything that comes after the chunk forward in time so that there’s no gap where the audio’s been removed.


Before region CUT **After region CUT**

Why You’d Use Region CUT

You can use region CUT when you want to get rid of a portion of a performance, replacing it with what comes after. For example, if you’ve recorded a soloist playing over a fadeout, and the first eight bars of the fadeout aren’t as good as the rest—you can cut the unwanted eight bars and move the best part of the performance forward.

Chop out an entire unwanted section of a project by using CUT on all of its tracks.

Thanks to the VS-2400CD’s non-destructive editing, audio you cut is still safe and sound on your hard drive if you want it back, until you optimize the project. You can use Undo to retrieve it, or create a new phrase from its original take (see Page 255).

Edit Points

- *IN*—sets the beginning of the audio segment you’re cutting out of the track.
- *OUT*—sets the end of the audio segment you’re cutting out of the track.

Make sure there’s no audio within .5 seconds before the IN point and .5 seconds after the OUT point to ensure a smooth transition.

AllVTr

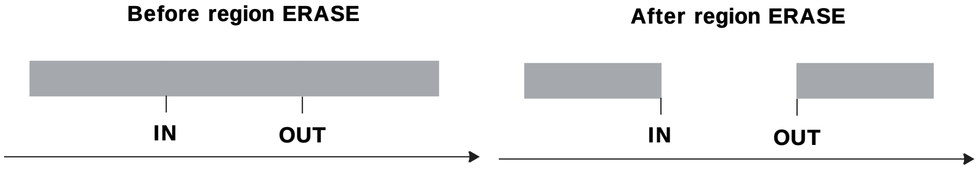
Turn AllVTr on if you want to remove the chunk of time from all of the V-Tracks belonging to a selected track.

ERASE

Use: Mouse, TRACK menu

TRACK menu
F5 (ERASE)

Erase removes a specified region from a selected track, leaving all of its other audio where it is.



Why You’d Use Region ERASE

Region ERASE is a really good way to get rid of unwanted audio—wrong notes, noises, throat-clearing, unwanted chatter and so on—on a track without affecting the rest of its audio.

Thanks to the VS-2400CD’s non-destructive editing, anything you erase is still on your hard drive if you want it back, until you optimize the project. Use Undo to retrieve it, or create a new phrase from its original take (see Page 255).

Edit Points

- *IN*—sets the beginning of the audio segment you’re erasing.
- *OUT*—sets the end of the audio segment you’re erasing.

Make sure there’s no audio within .5 seconds before the IN point and .5 seconds after the OUT point to ensure a smooth transition.

AllVTr

Turn AllVTr on if you want to remove the audio from all of the V-Tracks belonging to a selected track. You’ll want to do this if each V-Track contains a different performance attempt, and they all contain the same mistake.

COMP/EXP.

Use: Mouse, TRACK menu

TRACK menu
F1 (CmpExp)

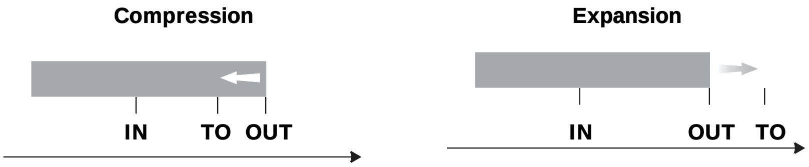
The region COMP/EXP. (“Compression/Expansion”) operation allows you to time-stretch or time-shrink a region, with or without changing the region’s pitch.

Time compression and expansion cannot be used on tracks recorded using the CDR recording mode.

Since the COMP/EXP. operation makes a new copy of any region it’s processing, it can be performed only when there’s sufficient free space on your hard drive.

Once you've defined the desired region, the location of the TO point determines whether the region's audio will be stretched out or shrunk. If the TO point is:

- *before the OUT point*—the region's audio is made shorter in duration.
- *after the OUT point*—the region is made longer in duration.



Why You'd Want to Use Region COMP/EXP.

You can use COMP/EXP. to make audio fit a groove in a dance track. You can also use it to make a region meet the time constraints of a TV or radio commercial or a soundtrack.

You can stretch a region to fill a blank space in the playlist by placing TO at the beginning of the next audio. Likewise, if a region's too large to fit in an available gap, place TO where the region overlaps the audio following it to shrink it to the right size.

Edit Points

- *IN*—sets the beginning of the region to be stretched or shrunk.
- *OUT*—sets the end of the region to be stretched or shrunk.

The length of time between the IN and OUT points must be greater than .5 seconds.

- *TO*—sets the amount of time compression or expansion to be applied, according to its position before (compression) or after (expansion) the OUT point.

You can compress the region's length to as little as 75% or expand by as much as 125%. Be aware that the more extreme the amount of compression or expansion, the more the region's audio quality may degrade.

TYPE

The VS-2400CD offers three different time compression/expansion algorithms. Select the one that most closely describes the region's audio:

- A: Vocal, Narration
- B: Slow-tempo Songs
- Fast-tempo Songs

Pitch

When Pitch is set to:

- *Variable*—the region's pitch is raised or lowered by the same amount that its length is compressed or expanded, respectively.
- *Fixed*—the region's pitch stays the same regardless of the change to its length.

Amp

The time compression/expansion process can change a region's level, and if its level becomes too high, distortion results. The Amp parameter lets you set the region's post-processing loudness. We recommend trying a setting of 60% to start. If the processed region is too quiet, perform an Undo and try again with a higher percentage. You can set this parameter to the following level percentages: 50, 60, 70, 80, 90, 100.

IMPORT

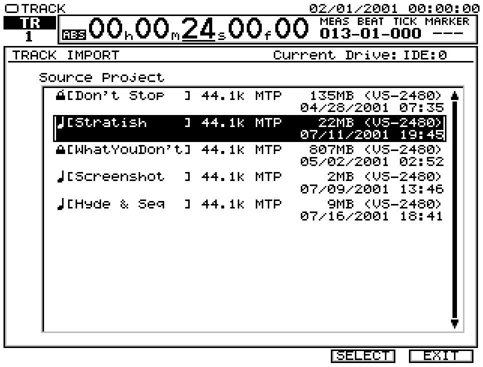
Use: Mouse, TRACK menu

TRACK menu F2 (IMPORT)

You can import a track from another project recorded using the same sampling rate and recording mode as the current project.

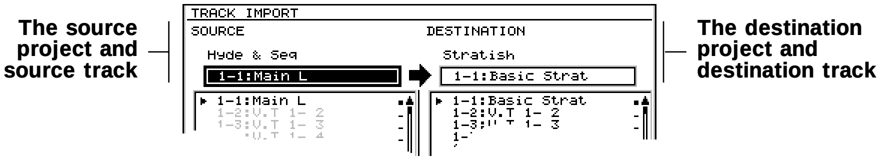
You can import CDR-mode disk-image audio (Page 330) into any project, regardless of its sampling rate or recording mode. If the project uses the CDR mode, you can import the image to any V-Tracks. Otherwise, you can import it only to unused V-Tracks belonging to Tracks 23 and 24. CDR-recorded audio is always stereo, so it's imported to two tracks—when you select a destination track, its odd/even partner is also selected.

When you select IMPORT, the VS-2400CD scans the selected drive and presents you a list of all projects that contain importable audio.



```
TRACK                                          02/01/2001 00:00:00
TR 1   ABS 00h00m24s00f00   MEAS BEAT TICK MARKER
                            013-01-000  ---
TRACK IMPORT                          Current Drive: IDE:0
   Source Project
   [Don't Stop   ] 44.1k MTP   135MB (VS-2480)
                               04/28/2001 07:35
   [Stratish     ] 44.1k MTP    22MB (VS-2480)
                               07/11/2001 19:45
   [WhatYouDon't] 44.1k MTP   807MB (VS-2480)
                               05/02/2001 02:52
   [Screenshot   ] 44.1k MTP     2MB (VS-2480)
                               07/09/2001 13:46
   [Hyde & Seq   ] 44.1k MTP     9MB (VS-2480)
                               07/16/2001 18:41
```

Select the desired project and press F5 (OK). On the screen that appears, you can select the track you want to import, and the track in the current project on which you want to place the imported audio.



```
TRACK IMPORT
SOURCE                      DESTINATION
  Hyde & Seq                  Stratish
  1-1:Main L              ➡  1-1:Basic Strat
 ▶ 1-1:Main L               ▶ 1-1:Basic Strat
   1-2:V.T 1- 2               1-2:V.T 1- 2
   1-3:V.T 1- 3
```

The source project and source track
The destination project and destination track

To return to the main IMPORT screen, press F1 (<<BACK).

Why You'd Use Region IMPORT

IMPORT lets you share favorite recordings between projects, or create new projects based on previously recorded source materials.

SOURCE

Turn the Time/Value dial to select the track you want to import.

DESTINATION

Turn the Time/Value dial to select the track in the current project on which you want to place the imported audio.

EXCHANGE

Use: TRACK menu

TRACK menu
F3 (Exchng)

Region EXCHANGE allows you to swap audio regions between source and destination tracks.

Why You'd Use Region EXCHANGE

Region EXCHANGE lets you re-organize a project's tracks to make them easier to work with. Also, you can use EXCHANGE to re-order tracks to facilitate channel linking.

How to Use Region EXCHANGE

On the EXCHANGE main screen, select the desired source track—specifically, the data on its active V-Track—and the desired destination V-Track using the methods described in Chapter 18.

Make sure not to use the same destination V-Track(s) for more than one source track or linked pair of source tracks.

ARRANGE

Use: TRACK menu

TRACK menu
F4 (Arrnge)

Region ARRANGE lets you move regions around within a project to re-arrange the order of its sections. When you re-arrange a project's sections, you create a new playlist.

ARRANGE identifies each section of a project by the marker placed at the start of the section and the marker at the end of the section. If one section runs right into the next, you don't need to place a separate marker at the end of the first section—the VS-2400CD can use the marker at the start of the next section as the end marker for the first section. Place the markers you need before editing—see Page 182 to learn about markers.

Since region ARRANGE lets you restructure a project without creating any new audio files on your hard drive, it doesn't appreciably increase the size of the project, no matter how long a new playlist you create.

Why You'd Use Region ARRANGE

Region ARRANGE lets you try out different structures for your project. If you're recording a song, you can move its pieces around until you're satisfied with the way it flows. If a project contains multiple pieces or songs, you can re-arrange their order.

You can undo a new project arrangement you'd decided you don't like.

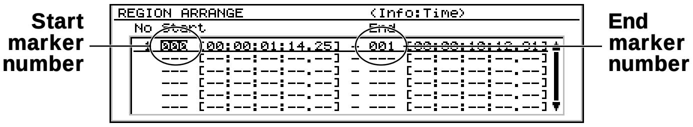
Edit Points

- *TO*—sets the start of the newly created playlist.

Creating a New Playlist

On the region ARRANGE main screen:

1. Press F1 (CREATE) to create the first segment of the new playlist.
2. Cursor to the segment's Start marker number.

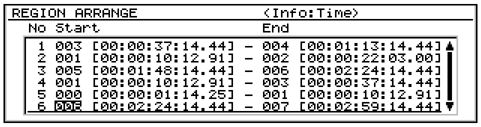


```
REGION ARRANGE              <Info:Time>
  No Start                  End
   1 000 [00:00:01:14.25] - 001 [00:00:10:12.91]
     --- [--:--:--:--.--] - --- [--:--:--:--.--]
     --- [--:--:--:--.--] - --- [--:--:--:--.--]
     --- [--:--:--:--.--] - --- [--:--:--:--.--]
     --- [--:--:--:--.--] - --- [--:--:--:--.--]
     --- [--:--:--:--.--] - --- [--:--:--:--.--]
```

3. Turn the Time/Value dial to select the marker at the start of the desired section.
4. Cursor to the segment's End marker number.
5. Turn the Time/Value dial to select the marker at the end of the section.
6. Press F1 (CREATE) to create the next playlist segment.
   The VS-2400CD creates a new segment with the same settings as the segment before it. Since you can't set a Start marker number to be higher than an End marker's number, set the new segment's End marker number first.

If you ever find you can't raise a segment's Start marker number, check the segment's End marker number to make sure that it's set higher than the desired Start marker.

7. Cursor to the segment's End marker number.
8. Turn the Time/Value dial to select the marker at the end of the section you want to use in the second segment.
9. Cursor to the segment's Start marker number.
10. Turn the Time/Value dial to select the marker at the start of the section.
11. Repeat Steps 6-11 for all of the desired remaining playlist segments.



```
REGION ARRANGE              <Info:Time>
  No Start                  End
   1 003 [00:00:37:14.44] - 004 [00:01:13:14.44]
   2 001 [00:00:10:12.91] - 002 [00:00:22:03.00]
   3 005 [00:01:48:14.44] - 006 [00:02:24:14.44]
   4 001 [00:00:10:12.91] - 003 [00:00:37:14.44]
   5 000 [00:00:01:14.25] - 001 [00:00:10:12.91]
   6 006 [00:02:24:14.44] - 007 [00:02:59:14.44]
```

12. If you need to change the settings for any segment, cursor to the desired settings and change them.

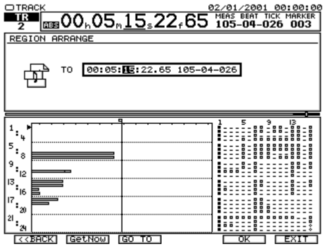
You can press:

- *F2 (AllClr)*—to clear all of the segments from the playlist.
- *F3 (DELETE)*—to clear the currently selected segment.
- *F4 (Insert)*—to add a new segment above the currently select segment.

Placing and Activating a New Playlist

Once you've created the new playlist, you must place it at the desired location in the project in order to activate it. To do this:

1. Press F5 (NEXT)—the ARRANGE TO screen appears.



```
TRACK                              02/01/2001 00:00:00
TR 2   ABS 00h05m15s22f65   MEAS BEAT TICK MARKER
                            105-04-026      003
REGION ARRANGE
  TO  00:05:15:22.65 105-04-026
```

The TO location is the place in the project where the playlist is to start.

If you select a TO location that's before or somewhere in the middle of the project's currently active playlist, the new playlist is placed on top of the older one, taking the place of the older playlist wherever they overlap. If you position the new playlist after the currently active playlist, a new marker is automatically placed at the start of the new playlist to make it easy to navigate to.

2. Set TO to the desired project location. You can:
    - dial in the desired location using the Time/Value dial.
    - move the now line to the desired location using the current time location display at the top of the screen, and then press F2 (GetNow).

To move the now line to the current TO location, press F3 (GO TO).

3. Press F5 (OK) to activate and place the playlist in the project, F1 (<<BACK) to return to the main ARRANGE screen, or F6 (EXIT) to cancel the ARRANGE operation.

NAME

Use: TRACK menu

The VS-2400CD allows you to name any of the tracks in a project. The main NAME screen provides a track selection display where you can select the track you want to name. To learn about the VS-2400CD's naming tools, see "Naming" on Page 71.

NAME

TRACK menu
F5 (NAME)

Why You'd Use Region NAME

Naming a track allows you to easily identify it on the VGA Info Display and when you're selecting tracks during editing.

21—Working with the VS-2400CD Outputs

The VS-2400CD offers a wide range of analog output jacks and digital connectors from which you can send its audio signals to external devices. This chapter discusses how to route signals to them and how they can be used.

The VS-2400CD Outputs

Output Pairs

The VS-2400CD's analog and digital outputs are managed as left/right or odd/even output pairs when you're routing signals to them. These pairs can't be altered.

Analog Output Jacks

The VS-2400CD has eight 1/4" analog output jacks that you can connect to external devices when you want to send audio signals out of the VS-2400CD. You can use the jacks for the jobs suggested by their names or for any other purpose in which you need to get a VS-2400CD audio signal to an external device that has analog inputs.

When you're routing busses to them, the eight 1/4"mono analog output jacks are divided into the following four sets of stereo jacks:

- MASTER L/R
- AUX A L/R
- AUX B L/R
- MONITOR L/R

When you're routing track signals directly to the analog jacks—perhaps to send them to tracks on an external multitrack recorder with analog inputs—they're divided into the following four pairs of output jacks:

- ANALOG MULTI 1 and 2
- ANALOG MULTI 3 and 4
- ANALOG MULTI 5 and 6
- ANALOG MULTI 7 and 8

The MONITOR bus' signal is automatically routed to the stereo 1/4" PHONES jack.

Digital Output Connectors

The VS-2400CD provides coaxial, optical and R-BUS digital output connectors.

Coaxial and Optical Output Connectors

The VS-2400CD has one coaxial and one optical output each (Page 50).

If you've connected a VS-2400CD digital output to a device that's using a lower bit rate, you can dither the VS-2400CD's output down to that bit depth—see Page 357.

You can activate digital copy-protection to prevent the making of digital copies of audio you've recorded on a connected external DAT or MiniDisc recorder—see Page 358.

For a detailed discussion of master clock considerations when sending digital audio from device to device, see Page 128.

R-BUS Connector

The VS-2400CD's R-BUS connector provides eight input and eight output channels of digital audio. (During routing we refer to each channel as a "connector.") You can send signals out of the VS-2400CD digitally to any R-BUS device.

You can find setup instructions for R-BUS devices in the "Supplemental Information" chapter at the back of the *VS-2400CD Owner's Manual.*

With a Roland DIF-AT interface, you can digitally send individual VS-2400CD track signals to tracks on an ADAT™ or Tascam® T-DIF™ recorder.

Output Signal Routing

You can route bus signals or track signals to the VS-2400CD's analog and digital outputs. We'll discuss these two topics separately.

You can route busses or tracks directly to outputs, but not both simultaneously, with the exception of the MONITOR bus, which can always be sent to outputs.

Bus Routing

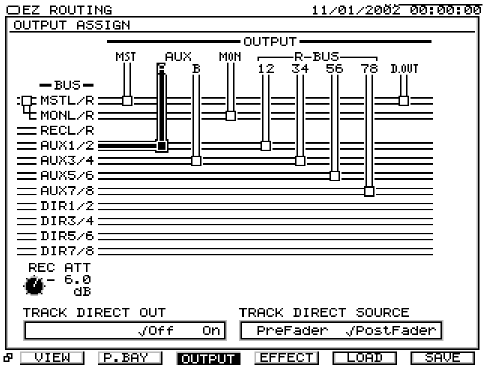
The VS-2400CD's output jacks and connectors can transmit MASTER, MONITOR, Aux and Direct path signals from the VS-2400CD's outputs to external devices. With the exception of the MASTER and MONITOR analog outputs, you can route any pair of busses—or a stereo bus—to any pair of output jacks or connectors.

- The MASTER analog jacks always carry the stereo MASTER bus signal.
- The MONITOR analog jacks always carry the stereo MONITOR bus signals—you can, however, send the signals from any pair of busses into the stereo MONITOR bus feeding the MONITOR jacks.

Though busses are routed to outputs in pairs, you can send completely different signals on each bus pair's odd/even busses. If you're using Aux busses, the busses can be linked in stereo (Page 200) or not, as desired.

Routing a Pair of Busses to a Pair of Outputs

1. Press EZ ROUTING.
2. If "OUTPUT" isn't above F3, press PAGE repeatedly until it is.
3. Press F3 (OUTPUT)—the OUTPUT ASSIGN screen appears.



REC ATT - 6.0 dB

TRACK DIRECT OUT ✓Off On

TRACK DIRECT SOURCE PreFader ✓PostFader

In this illustration, we've selected the Aux A analog jacks.

Aux Busses 1 and 2 are routed to the Aux A jacks, as shown by the thick black connection line.

Each bus runs from left to right across the display. When you select an output and turn the Time/Value dial, a connection box moves down the screen to reach the desired bus.

If the TRACK DIRECT OUT parameter is turned on, turn it off to activate bus routing. When you do this, routings between tracks and outputs are de-activated, though their connections remain in place.

The output jack and connector pairs run along the top of the screen, and the bus pairs run up and down its left edge.

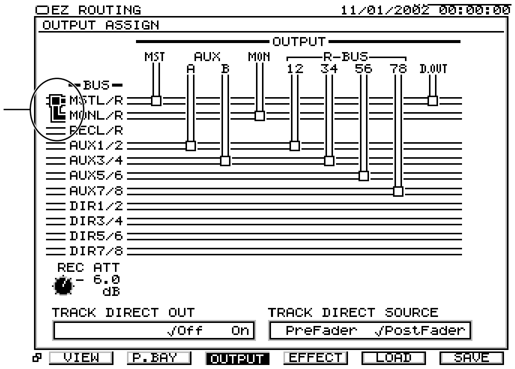
4. Use ◀ or ▶ to select the desired pair of output jacks or digital connectors.
5. Turn the Time/Value dial to choose the desired pair of busses to be routed to the selected output pair—as you turn the dial, the connection box moves up and down the display, showing you what's routed to the selected pair of outputs.

If you prefer, you can route busses to outputs by dragging an output pair's connection box down to the desired bus pair with your mouse.

The coaxial and optical digital outputs are always active, and carry the same signal.

Routing a Pair of Busses to the Stereo MONITOR Bus

1. Press EZ ROUTING.
2. If "OUTPUT" isn't above F3, press PAGE repeatedly until it is.
3. Press F3 (OUTPUT)—the OUTPUT ASSIGN screen appears.



REC ATT -6.0 dB

TRACK DIRECT OUT: √Off On

TRACK DIRECT SOURCE: PreFader √PostFader

MONITOR bus assignment junction

In this illustration, we've selected the MONITOR bus assignment junction, and the stereo MASTER bus is selected as the signal being sent to the stereo MONITOR bus.

The assignment of a pair of busses—or a stereo bus—to the stereo MONITOR bus is shown by the MONITOR bus assignment junction at the left of the output routing area on the OUTPUT ASSIGN screen as shown above.

MONITOR bus assignment is unaffected by the setting of the TRACK DIRECT OUT parameter—you can route signals to the MONITOR bus at any time.

4. Press ◀ to highlight the MONITOR bus assignment junction.
5. Turn the Time/Value dial to choose the pair of busses to be sent to the stereo MONITOR bus—as you turn the dial, the connection moves up and down through the busses on the left side of the display, showing what's being sent to the bus.

Monitoring the Recording Busses Directly

To listen to the recording busses (Page 57) directly without sending them through their track channels, assign REC L/R to the MONITOR bus. When you do this:

- All 16 recording busses are combined into a single stereo signal for monitoring.
- You can adjust this stereo signal's level using the REC ATT parameter.

Track Direct Outs

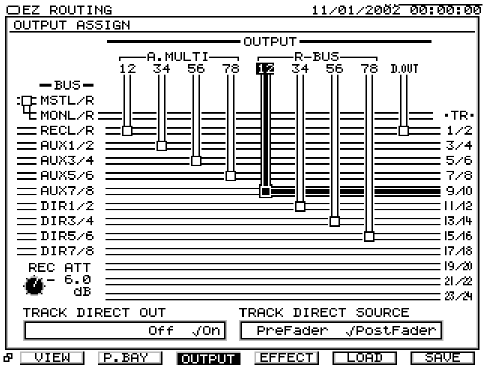
You can route any odd/even pair of the VS-2400CD's tracks directly to a pair of outputs on the EZ ROUTING OUTPUT ASSIGN screen. By default, the screen is set up for bus routing, so you'll need to activate the track direct outs when you want to send tracks to outputs without using busses. You can select whether the tracks' signals are to be sent to outputs before or after their track channel faders.

When the track direct outs are turned on, Aux and Direct path output connections aren't available. If you need to send a combination of tracks and Aux or Direct paths to outputs, send the tracks via Direct paths instead of the track direct outs—see Page 196.

Track direct outs are a great way to transfer tracks via R-BUS and an RPC-1 PCI card to a computer for editing or effect processing. It's also easy to send tracks to a TASCAM DA series recorder or ADAT multitrack recorder connected via R-BUS and DIF-AT to the VS-2400CD.

Routing a Pair of Tracks to a Pair of Outputs

1. Press EZ ROUTING.
2. If "OUTPUT" isn't above F3, press PAGE repeatedly until it is.
3. Press F3 (OUTPUT)—the OUTPUT ASSIGN screen appears.
4. Press ▼ to select the TRACK DIRECT OUT parameter.
5. Turn the TRACK DIRECT OUT parameter on—the screen changes to show track output routing connections.



TRACK DIRECT OUT: Off √On

TRACK DIRECT SOURCE: PreFader √PostFader

In this illustration, we've selected the R-BUS connection.

Tracks 9 and 10 are currently routed to the first and second R-BUS digital output channels.

When you do this, routings between busses and outputs are de-activated, though their connections remain in place behind the scenes.

On the OUTPUT ASSIGN screen, you can route any pair of tracks to the desired pair of outputs. The output jack and connector pairs run along the top of the screen, and the track pairs run up and down its right edge.

6. Use ◀ or ▶ to highlight the desired pair of output jacks or digital connectors.
7. Turn the Time/Value dial to choose the pair of tracks you want to route to the selected output pair—as you turn the dial, the connection moves up and down the display, showing you what's currently routed to the selected pair of outputs.

If you prefer, you can route tracks to outputs by dragging an output pair's connection box down to the desired track pair with your mouse.

When the track direct outs are active, the MASTER bus can't be routed directly to outputs. However, you can send it into the MONITOR bus, which can be.

Setting Up Pre or Post Track Direct Outputs

1. At the bottom right of the OUTPUT ASSIGN screen—see the previous illustration—select the TRACK DIRECT SOURCE.
2. Turn the Time/Value dial to select:
    - *PreFader*—so that track signals are sent to outputs unaffected by the positions of their track channel faders.
    - *PostFader*—so that the tracks' track channel faders control their output levels.

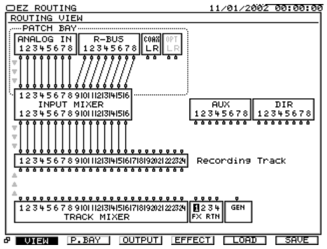
22—EZ Routing

The EZ ROUTING screens are where you go to set up the connections that allow signals to travel within the VS-2400CD. This chapter provides an overview of the EZ ROUTING screens we've been discussing all along, and describes the VS-2400CD's helpful EZ Routing tools.

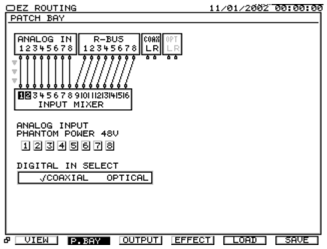
The EZ ROUTING Screens

There are four EZ ROUTING screens on which routing is performed:

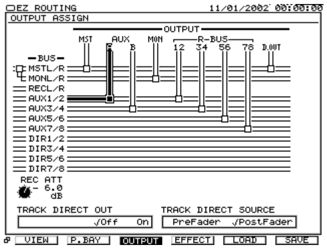
EZ ROUTING VIEW


EZ ROUTING
11/01/2002 00:00:00
ROUTING VIEW
PATCH BAY
ANALOG IN
R-BUS
COAX
OPT
INPUT MIXER
AUX
DIR
Recording Track
TRACK MIXER
FX RTN
GEN
VIEW
P.BAY
OUTPUT
EFFECT
LOAD
SAVE

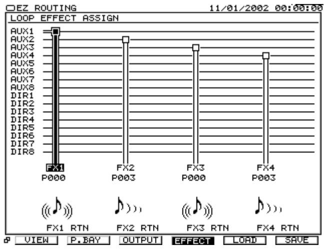
PATCH BAY


EZ ROUTING
11/01/2002 00:00:00
PATCH BAY
ANALOG IN
R-BUS
COAX
OPT
INPUT MIXER
ANALOG INPUT
PHANTOM POWER 48V
DIGITAL IN SELECT
√COAXIAL OPTICAL
VIEW
P.BAY
OUTPUT
EFFECT
LOAD
SAVE

OUTPUT ASSIGN


EZ ROUTING
11/01/2002 00:00:00
OUTPUT ASSIGN
OUTPUT
MST
AUX
MON
R-BUS
BUS
MSTL/R
MONL/R
RECL/R
AUX1/2
AUX3/4
AUX5/6
AUX7/8
DIR1/2
DIR3/4
DIR5/6
DIR7/8
REC ATT
6.0 dB
TRACK DIRECT OUT
√Off On
TRACK DIRECT SOURCE
PreFader √PostFader
VIEW
P.BAY
OUTPUT
EFFECT
LOAD
SAVE

LOOP EFFECT ASSIGN


EZ ROUTING
11/01/2002 00:00:00
LOOP EFFECT ASSIGN
AUX1
AUX2
AUX3
AUX4
AUX5
AUX6
AUX7
AUX8
DIR1
DIR2
DIR3
DIR4
DIR5
DIR6
DIR7
DIR8
FX1 P000
FX2 P003
FX3 P000
FX4 P003
FX1 RTN
FX2 RTN
FX3 RTN
FX4 RTN
VIEW
P.BAY
OUTPUT
EFFECT
LOAD
SAVE

Navigating the EZ ROUTING Screens

To view the EZ ROUTING screens, press EZ ROUTING.

The EZ ROUTING screens have two pages that are identical except for the F buttons displayed at the bottom of the screen. Press PAGE to toggle between these two sets of F buttons. One page has a set of F buttons for each EZ ROUTING screen:

- F1 (VIEW)
- F2 (P.BAY)
- F3 (OUTPUT)
- F4 (EFFECT)

Press a screen's F button to view the screen.

The other page provides tools for resetting input and hard disk recorder track routings:

- F1 (IniPB)
- F2 (ClrPB)
- F3 (IniTrA)
- F4 (ClrTrA)

We'll discuss these on Page 281.

EZ ROUTING VIEW Screen

The EZ ROUTING VIEW screen shows—and allows you to interconnect—all of your:

- input jacks and connectors
- Aux busses
- hard disk recorder tracks
- FX return channels
- input channels
- Direct paths
- track channels

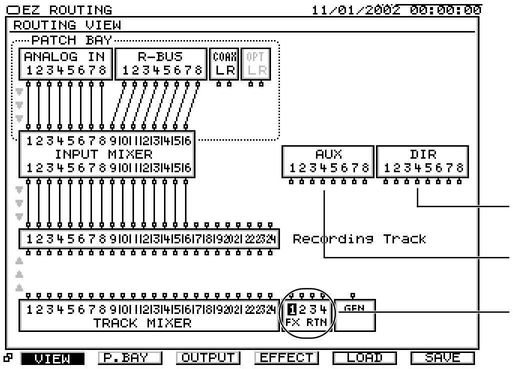
Input jacks and connectors

Input channel inputs

Input channel outputs

Hard disk recorder track inputs

Track channel outputs


EZ ROUTING
11/01/2002 00:00:00
ROUTING VIEW
PATCH BAY
ANALOG IN
12345678
R-BUS
12345678
COAX
LR
OPT
LR
12345678910111213141516
INPUT MIXER
12345678910111213141516
AUX
12345678
DIR
12345678
123456789101112131415161718192021222324
Recording Track
123456789101112131415161718192021222324
TRACK MIXER
1234
FX RTN
GEN
VIEW
P.BAY
OUTPUT
EFFECT
LOAD
SAVE

The gray arrows at the left edge of the screen show the direction in which signal is flowing.

Direct paths

Aux busses

FX return channel outputs

The area of the EZ ROUTING VIEW screen that includes the input jacks and connectors is called the "patch bay"—it's identified by a dotted outline. The patch bay has its own screen, described below.

Making Connections on the EZ ROUTING VIEW Screen

1. Use ◀, ▶, ▲ or ▼ to select the desired input or output connection. You can select:
    - pairs of input channel inputs
    - Aux bus outputs
    - Track channel outputs
    - input channel outputs
    - Direct path outputs
    - FX return channel outputs
2. Turn the Time/Value dial to create the desired connection.

We've already described various EZ ROUTING VIEW connections in detail in other parts of the *VS-2400CD Owner's Manual*.

To learn how to route:	*See:*
input channels to tracks for recording	Page 168
track channels to tracks for bouncing	Page 192
FX return channels to tracks for recording and bouncing	Page 229

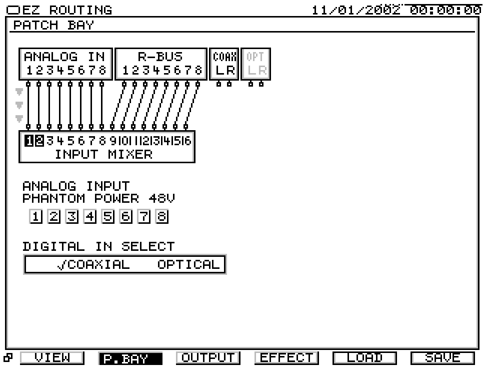
Patch bay connection descriptions are discussed in the following section.

The EZ ROUTING PATCH BAY Screen

The primary purpose of the EZ ROUTING PATCH BAY screen is the connection of analog input jacks and digital input connectors to the VS-2400CD's input channels. Input connections are described in Chapter 9, which starts on Page 125.

On the PATCH BAY screen, you can route the following jacks and connectors to input channels:

- the 16 analog input jacks (XLR and 1/4”)
- The R-BUS connectors’ 8 digital channels
- the coaxial digital connector or the optical digital connector (Page 127)


EZ ROUTING
11/01/2002 00:00:00
PATCH BAY
ANALOG IN
12345678
R-BUS
12345678
COAX
LR
OPT
LR
12345678910111213141516
INPUT MIXER
ANALOG INPUT
PHANTOM POWER 48V
1 2 3 4 5 6 7 8
VIEW
P.BAY
OUTPUT
EFFECT
LOAD
SAVE

DIGITAL IN SELECT
√COAXIAL OPTICAL

Input jacks and connectors

Input channel inputs

The gray arrows at the left edge of the screen show the direction in which signal is flowing.

You can also turn phantom power on or off for the XLR input jacks, and activate the desired digital inputs on this screen, as described on Page 126 and Page 127, respectively.

Making Connections on the EZ ROUTING PATCH BAY Screen

For the purposes of routing, input jacks and connectors and input channels are treated as odd/even pairs. These pairs cannot be altered.

1. Use ◀, ▶, ▲ or ▼ to select the desired pair of input channels.
2. Turn the Time/Value dial to create the desired connection.

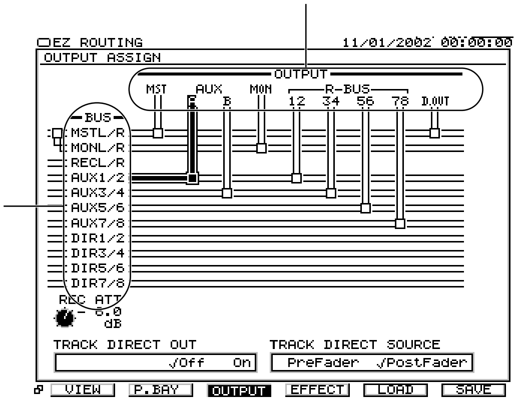
Chapter 9 describes in detail how to route inputs to input channels—see Page 132.

The EZ ROUTING OUTPUT ASSIGN Screen

On the EZ ROUTING OUTPUT ASSIGN screen, you can route any of the VS-2400CD’s busses or tracks to output jacks or connectors. The screen’s appearance changes slightly for the two types of routing.

Outputs

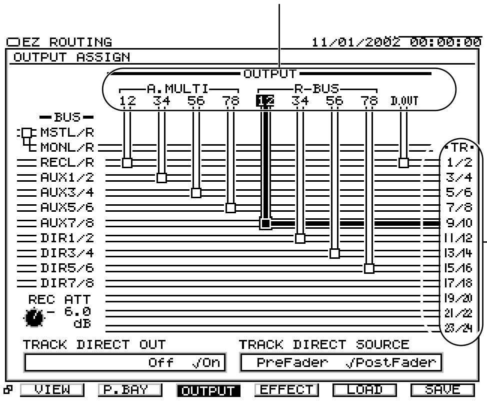
Busses


EZ ROUTING
11/01/2002 00:00:00
OUTPUT ASSIGN
OUTPUT
MST
AUX
A
B
MON
R-BUS
12
34
56
78
D.OUT
BUS
MSTL/R
MONL/R
RECL/R
AUX1/2
AUX3/4
AUX5/6
AUX7/8
DIR1/2
DIR3/4
DIR5/6
DIR7/8
REC ATT
- 6.0
dB
VIEW
P.BAY
OUTPUT
EFFECT
LOAD
SAVE

TRACK DIRECT OUT
√Off On
TRACK DIRECT SOURCE
PreFader √PostFader

When routing busses

Outputs


EZ ROUTING
11/01/2002 00:00:00
OUTPUT ASSIGN
OUTPUT
A.MULTI
12
34
56
78
R-BUS
12
34
56
78
D.OUT
BUS
MSTL/R
MONL/R
RECL/R
AUX1/2
AUX3/4
AUX5/6
AUX7/8
DIR1/2
DIR3/4
DIR5/6
DIR7/8
TR
1/2
3/4
5/6
7/8
9/10
11/12
13/14
15/16
17/18
19/20
21/22
23/24
REC ATT
- 6.0
dB
VIEW
P.BAY
OUTPUT
EFFECT
LOAD
SAVE

TRACK DIRECT OUT
Off √On
TRACK DIRECT SOURCE
PreFader √PostFader

Tracks

When routing tracks

On this screen, you can also configure the track direct outputs so that they're pre-fader or post fader (Page 275), and adjust your listening level using the REC ATT parameter (Page 273) when you're listening to the 16 recording busses instead of the MASTER mix.

Making Connections on the EZ ROUTING OUTPUT ASSIGN Screen

For the purposes of routing, busses are treated as odd/even pairs that can include two mono busses or one stereo bus. Tracks are also routed in pairs. Outputs are divided into odd/even, left/right pairs as well. These pairs cannot be altered.

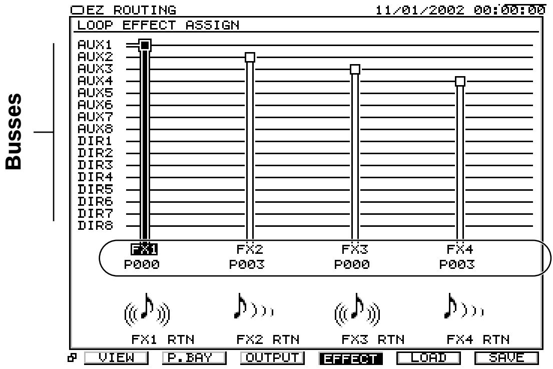
1. Use ◀ or ▶ to select the desired pair of outputs.
2. Turn the Time/Value dial to create the desired connection.

If you cursor all the way to the left, you'll select the MONITOR bus assignment junction. Turn the Time/Value dial to select the pair of busses—or stereo bus—you'd like to send into the stereo MONITOR bus.

Output routing is described in detail in Chapter 21. In addition, on Page 73, you'll find a detailed set of steps for setting up digital monitoring through a pair of Roland DS-90A or DS -50A Digital Reference Monitors.

The EZ ROUTING LOOP EFFECT ASSIGN Screen

On the EZ ROUTING LOOP EFFECT ASSIGN screen, you can select the Aux or Direct path that carries signals to each of the VS-2400CD's internal effect processors. You can also see a symbol for each processor's currently selected effect patch.



Busses

If there's no optional VS8F-2 effect expansion board installed for an effect processor, "No FX Board" appears instead of an effect patch symbol.

Effect processors

If an Aux bus is linked to its odd/even partner (Page 200), "L" and "R" are attached to the end of their names.

Making Connections on the LOOP EFFECT ASSIGN Screen

1. Use ◀ or ▶ to select the desired internal effect processor.
2. Turn the Time/Value dial to select the desired Aux bus or Direct path.

Linked Aux busses are routed to an internal effect as a single stereo source.

The routing of Aux busses and Direct paths to the internal effects is discussed in detail on Page 204.

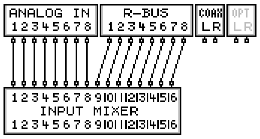
EZ Routing Tools

IniPB
ClrPB
IniTrA
ClrTrA

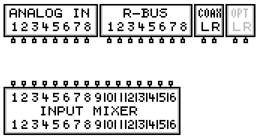
The EZ Routing tools that appear at the bottom of the EZ ROUTING VIEW, PATCH BAY, OUTPUT and EFFECT screens allow you to clear and initialize connections between inputs and input channels—patch bay connections—and the routing of any signals to the hard disk recorder tracks.

When the patch bay connections are:

- *initialized*—Analog Input Jacks 1-8 and R-BUS Connectors 1-8 are connected to Input Channels 1-16.

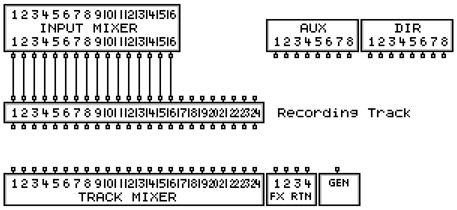

ANALOG IN
12345678
R-BUS
12345678
COAX
LR
OPT
LR
12345678910111213141516
INPUT MIXER
12345678910111213141516

- *cleared*—no inputs are connected to input channels.

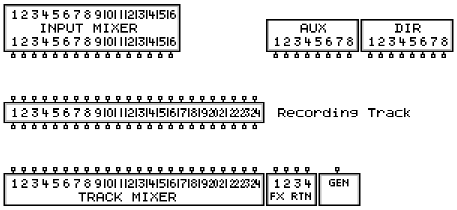

ANALOG IN
12345678
R-BUS
12345678
COAX
LR
OPT
LR
12345678910111213141516
INPUT MIXER
12345678910111213141516

When the hard disk recorder track connections are:

- *initialized*—Input Channels 1-16 are routed to Tracks 1-16.


12345678910111213141516
INPUT MIXER
12345678910111213141516
AUX
12345678
DIR
12345678
123456789101112131415161718192021222324
Recording Track
123456789101112131415161718192021222324
TRACK MIXER
1234
FX RTN
GEN

- *cleared*—no input channels, Aux busses, Direct paths, track channels or FX return channels are routed to tracks.


12345678910111213141516
INPUT MIXER
12345678910111213141516
AUX
12345678
DIR
12345678
123456789101112131415161718192021222324
Recording Track
123456789101112131415161718192021222324
TRACK MIXER
1234
FX RTN
GEN

To:	*Press:*
initialize all input-to-input channel routings	F1 (IniPB)
clear all input-to-input channel routings	F2 (ClrPB)
initialize all routings to hard disk recorder tracks	F3 (IniTrA)
clear all routings to hard disk recorder tracks	F4 (ClrTrA)

Saving and Loading EZ Routing Templates

As you use your VS-2400CD, you'll spend lots of time creating routing setups for the various situations in which you'll be recording and mixing. You can save a routing setup—along with a host of other parameters—as an EZ Routing template that you can use in any project. When you recall a template, all of the routings and parameter values it contains are instantly restored, saving you lots of setup time. You can save up to 20 EZ Routing templates.

While some of the parameters saved in an EZ Routing template are also stored in scenes, a scene belongs to a particular project, while an EZ Routing template is always available.

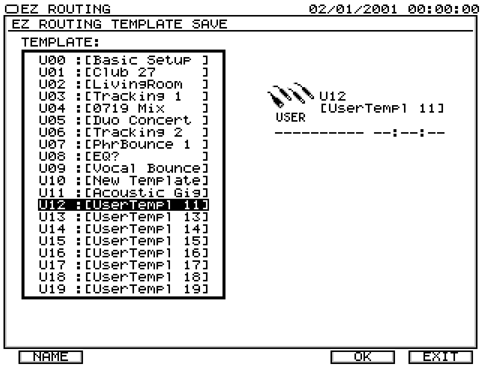
The VS-2400CD ships with seven always-available EZ Routing templates for recording, bouncing, mixdown and Surround mixing. You can find a list of the connections and parameters each of these templates installs on Page 451.

The Type of Settings a Template Contains

An EZ Routing template remembers everything that pertains to routing and configuration-related parameters—including input channel, track channel and Aux bus linking, V-Track selection and the current settings of the hard disk recorder's TRACK STATUS buttons.

Saving an EZ Routing Template

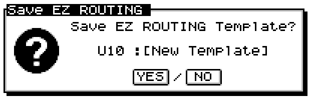
1. Set up your VS-2400CD as desired.
2. Press EZ ROUTING.
3. If "SAVE" isn't visible above F6, press PAGE until it is.
4. Press F6 (SAVE)—the EZ ROUTING TEMPLATE SAVE screen appears.



```
TEMPLATE:
 U00 :[Basic Setup ]
 U01 :[Club 27     ]
 U02 :[LivingRoom  ]
 U03 :[Tracking 1  ]
 U04 :[0719 Mix    ]
 U05 :[Duo Concert ]
 U06 :[Tracking 2  ]
 U07 :[PhrBounce 1 ]
 U08 :[EQ?         ]
 U09 :[Vocal Bounce]
 U10 :[New Template]
 U11 :[Acoustic Gig]
 U12 :[UserTempl 11]
 U13 :[UserTempl 13]
 U14 :[UserTempl 14]
 U15 :[UserTempl 15]
 U16 :[UserTempl 16]
 U17 :[UserTempl 17]
 U18 :[UserTempl 18]
 U19 :[UserTempl 19]

USER U12
     [UserTempl 11]
---------- --:--:--
```

5. Turn the Time/Value dial to select the desired user template memory location.
6. Press F1 (NAME) to name the template you're saving. See Page 71 to learn about naming. If you'd don't want to name the new template, skip this step.
7. When you're ready to finish saving the template, press F5 (OK), or press F6 (EXIT) to cancel the operation.



Save EZ ROUTING Template?

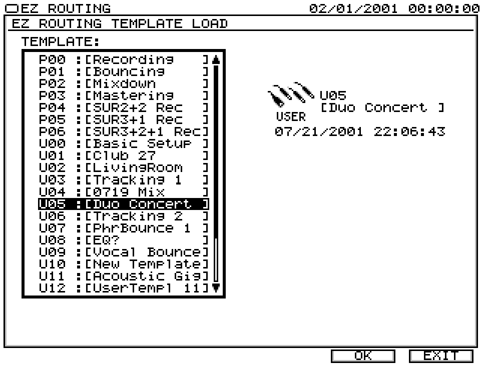
U10 :[New Template]

8. Press ENTER/YES to save the template, or EXIT/NO to cancel the operation.

Loading an EZ Routing Template

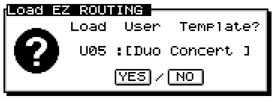
Before loading an EZ Routing template, it's a good idea to turn your listening level down all the way in case the template's new connections and settings cause feedback, result in unwanted noises or cause other problems.

1. Press EZ ROUTING.
2. If "LOAD" isn't visible above F5, press PAGE until it is.
3. Press F5 (LOAD)—the EZ ROUTING TEMPLATE LOAD screen appears.



```
EZ ROUTING                              02/01/2001 00:00:00
EZ ROUTING TEMPLATE LOAD
 TEMPLATE:
   P00 :[Recording   ]
   P01 :[Bouncing    ]
   P02 :[Mixdown     ]                U05
   P03 :[Mastering   ]                [Duo Concert ]
   P04 :[SUR2+2 Rec  ]           USER
   P05 :[SUR3+1 Rec  ]           07/21/2001 22:06:43
   P06 :[SUR3+2+1 Rec]
   U00 :[Basic Setup ]
   U01 :[Club 27     ]
   U02 :[LivingRoom  ]
   U03 :[Tracking 1  ]
   U04 :[0719 Mix    ]
   U05 :[Duo Concert ]
   U06 :[Tracking 2  ]
   U07 :[PhrBounce 1 ]
   U08 :[EQ?         ]
   U09 :[Vocal Bounce]
   U10 :[New Template]
   U11 :[Acoustic Gig]
   U12 :[UserTempl 11]
```

4. Turn the Time/Value dial to select the template you want to load.
5. Press F5 (OK). The VS-2400CD asks if you're sure you want to proceed.



```
Load EZ ROUTING
  Load  User  Template?
  U05 :[Duo Concert ]
```

6. Press ENTER/YES to load the template, or EXIT/NO to cancel the operation. If you press ENTER/YES, the template—and all of the routings and configuration settings it contains—loads.

23—MIDI and Synchronization

This chapter discusses the VS-2400CD's MIDI capabilities. The VS-2400CD can:

- act as a MIDI control surface that lets you manipulate parameters in an external MIDI device.
- be operated remotely from an external MIDI device.
- transmit its internal settings via MIDI to an external MIDI storage device.

We'll discuss the related topic of synchronization in the chapter's second half, explaining how to successfully sync the VS-2400CD with external devices such as MIDI sequencers, video editing systems and other analog and digital recorders.

MIDI Operations

If you're new to MIDI, see "About MIDI" in the *VS-2400CD Appendices*. Advanced MIDI users can find complete documentation of the VS-2400CD's MIDI features—including a MIDI implementation chart—in the *VS-2400CD Appendices*.

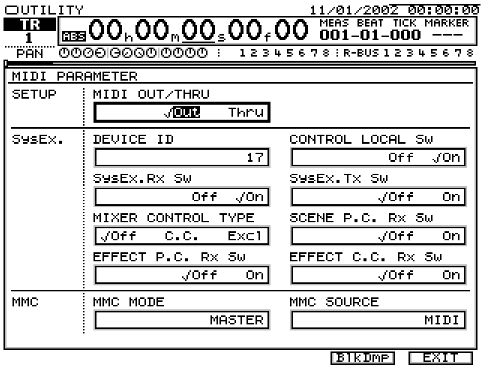
The VS-2400CD boasts a wide range of MIDI features that enhance its interaction with other MIDI devices in your system. We'll begin by discussing the basics of how MIDI works in the VS-2400CD.

VS-2400CD MIDI Basics

The MIDI PARAMETER Screen

You'll find all of the VS-2400CD's basic MIDI parameters on the UTILITY menu's MIDI PARAMETER screen. To get there:

1. Hold down SHIFT and press F4•UTILITY.
2. If "MIDI" isn't visible above F5, press PAGE until it is.
3. Press F5 (MIDI)—the MIDI PARAMETER screen appears.



MIDI PARAMETER

SETUP
MIDI OUT/THRU: √Out Thru

SysEx.
DEVICE ID: 17
CONTROL LOCAL Sw: Off √On
SysEx.Rx Sw: Off √On
SysEx.Tx Sw: √Off On
MIXER CONTROL TYPE: √Off C.C. Excl
SCENE P.C. Rx Sw: √Off On
EFFECT P.C. Rx Sw: √Off On
EFFECT C.C. Rx Sw: √Off On

MMC
MMC MODE: MASTER
MMC SOURCE: MIDI

4. Select the desired MIDI parameter and adjust its value.

MIDI OUT or THRU?

The VS-2400CD's MIDI OUT/THRU parameter sets the behavior of the MIDI OUT/THRU jack on the VS-2400CD's rear panel. It can be set to:

- *Out*—so that MIDI data produced by the VS-2400CD is transmitted to connected external MIDI devices. This is the typical setting.
- *Thru*—so that MIDI data received by the VS-2400CD passes through and exits the VS-2400CD unchanged. Use this setting only if you've arranged multiple MIDI devices in a daisy-chain and won't be sending any data from the VS-2400CD itself.

For all of the operations described in this chapter in which you're transmitting any kind of MIDI data from the VS-2400CD, set this parameter to OUT.

In the following sections, we describe connecting the VS-2400CD to a single external MIDI device. If you're using a MIDI patchbay, consult its documentation to learn how to route the VS-2400CD's MIDI OUT data to a desired MIDI device, and how to route a desired MIDI device's data to the VS-2400CD's MIDI IN jack.

Turning Fader Control On or Off

The setting of the MIDI PARAMETER screen's CONTROL LOCAL Sw determines whether or not the 12 channel strip faders and the master fader are active. You may want to disable the faders when you're controlling the VS-2400CD remotely—see Page 287—or if you want to protect your level settings from being accidentally changed. Set the parameter to:

- *Off*—so that channel strip fader movements have no effect on the levels of the currently selected input, track, Aux master or FX return channels.
- *On*—so that the faders set the levels of the currently selected input, track, Aux master or FX return channels. This is the default setting, since most often, you'll be controlling the VS-2400CD's levels locally, not via MIDI.

A Note About SysEx ID Numbers

If you're using multiple VS-2400CDs, it's important to assign each VS-2400CD its own System Exclusive, or "SysEx," ID number. Since VS-2400CD SysEx messages (Page 287) can be understood—and acted upon—by any VS-2400CD, only this ID number embedded in the SysEx data lets the VS-2400CD know if it's supposed to act on a SysEx message it receives.

In order to respond to a SysEx message, the VS-2400CD's ID number must be the same as the ID number embedded in the message—if it's set to another ID, the VS-2400CD ignores the SysEx data. If you change the VS-2400CD's ID, make note of its previous setting so that you'll still be able to receive any SysEx data created with the older ID.

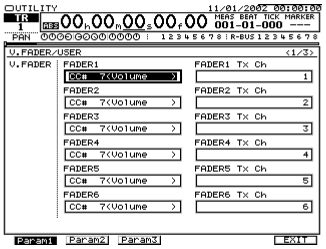
If you're working with a single VS-2400CD, there's no need to reset the MIDI PARAMETER screen's DEVICE ID parameter. With multiple VS-2400CDs, set each one to a different ID number—you can select any ID number from 1-32. ID 17 is the default.

V.Fader—The VS-2400CD MIDI Control Surface

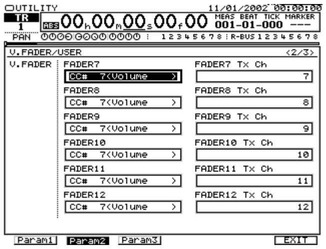
The V.Fader ("Virtual Fader") feature turns the VS-2400CD into a MIDI control surface with which you can adjust parameter values in an external MIDI device. In V.Fader mode, each of the 12 channel strip faders becomes a V.Fader. When you move a fader, it transmits MIDI Control Change values from the VS-2400CD's MIDI OUT/THRU jack.

Using the VS-2400CD as a MIDI Control Surface

1. Using a MIDI cable, connect the VS-2400CD's MIDI OUT/THRU jack to the MIDI IN of the device you want to control from the VS-2400CD.
2. Navigate to the MIDI parameter screen (Page 285).
3. Set MIDI OUT/THRU to Out.
4. Press F6 (EXIT).
5. Press PAGE once.
6. Press F6 (V.FDR)—the first V.FADER/USER screen appears.
   On the first two V.FADER/USER screens, you can select the Control Change transmitted by the VS-2400CD when a fader is moved.


UTILITY
11/01/2002 00:00:00
TR 1
ABS 00h00m00s00f00
MEAS BEAT TICK MARKER
001-01-000 ---
PAN
1 2 3 4 5 6 7 8 R-BUS 1 2 3 4 5 6 7 8
V.FADER/USER
<1/3>
V.FADER
Param1
Param2
Param3
EXIT

FADER1: CC# 7(Volume) — FADER1 Tx Ch: 1
FADER2: CC# 7(Volume) — FADER2 Tx Ch: 2
FADER3: CC# 7(Volume) — FADER3 Tx Ch: 3
FADER4: CC# 7(Volume) — FADER4 Tx Ch: 4
FADER5: CC# 7(Volume) — FADER5 Tx Ch: 5
FADER6: CC# 7(Volume) — FADER6 Tx Ch: 6


UTILITY
11/01/2002 00:00:00
TR 1
ABS 00h00m00s00f00
MEAS BEAT TICK MARKER
001-01-000 ---
PAN
1 2 3 4 5 6 7 8 R-BUS 1 2 3 4 5 6 7 8
V.FADER/USER
<2/3>
V.FADER
Param1
Param2
Param3
EXIT

FADER7: CC# 7(Volume) — FADER7 Tx Ch: 7
FADER8: CC# 7(Volume) — FADER8 Tx Ch: 8
FADER9: CC# 7(Volume) — FADER9 Tx Ch: 9
FADER10: CC# 7(Volume) — FADER10 Tx Ch: 10
FADER11: CC# 7(Volume) — FADER11 Tx Ch: 11
FADER12: CC# 7(Volume) — FADER12 Tx Ch: 12

7. To move between the V.FADER/USER screens, press F1 (Param1), F2 (Param2) or F3 (Param3).
8. Press V.FADER to activate the V.Fader feature—the V.FADER button lights. The VS-2400CD's faders now transmit the selected Control Change messages—their movements no longer affect VS-2400CD settings.

9. To exit V.Fader mode, press V.FADER—its indicator goes out, and the faders return to normal operation.

For a list of the Control Change messages the V.Faders can send, see "V-Fader Control Messages" on Page 463.

Remote MIDI Control of the VS-2400CD

The VS-2400CD can be controlled from an external MIDI device. Three types of MIDI messages can be used for this purpose. You can use:

- *System Exclusive ("SysEx") messages*—that can control most VS-2400CD functions.
- *Program Change and Bank Select messages*— to select scenes and effect patches.
- *Control Change messages*—that adjust important input channel, track channel, FX return channel, Aux bus, Direct path, MASTER bus and MONITOR bus parameters. You also can adjust effect and other parameters using NRPNs.

The various types of MIDI messages are described in the *VS-2400CD Appendices*. In the *Appendices,* System Exclusive messages are called "Exclusive" messages.

When sending and receiving SysEx or Control Change messages that control the VS-2400CD, take care to avoid MIDI loops. In a MIDI loop, the same MIDI messages are sent and received by the connected devices over and over, spiraling into nonsensical settings in either or both devices. In many sequencers, a Thru feature passes MIDI data back to the device from which it came—this feature should be turned off when working with VS-2400CD SysEx and Control Change messages.

NRPN

Remote Control of the VS-2400CD with SysEx Messages

You can control the VS-2400CD using SysEx messages in either of two ways.

Create SysEx Messages Manually

You can manually program the SysEx messages in an external MIDI device for transmission to the VS-2400CD. This method requires an in-depth understanding of MIDI programming—see the *VS-2400CD Appendices* for details.

Capture and Return SysEx Messages

Every VS-2400CD button-press, knob turn, fader move and so on can generate a SysEx message that you can transmit from the VS-2400CD's MIDI OUT/THRU connector. This data can be captured by an external MIDI recording device and transmitted back to the VS-2400CD. When you're using the VS-2400CD with a sequencer—as described later in this chapter—the sequencer can record *any* actions you perform on the VS-2400CD, going beyond even the extensive automation capabilities of the VS-2400CD's Automix feature. When the sequencer plays back, your moves are faithfully reproduced.

You can also store VS-2400CD settings in an external MIDI device using the VS-2400CD's SysEx bulk dump capabilities—see Page 290.

To transmit SysEx data from the VS-2400CD:

1. Using a MIDI cable, connect the VS-2400CD's MIDI OUT/THRU jack to the MIDI IN jack of the device in which you want to capture the VS-2400CD's SysEx data.
1. Navigate to the MIDI parameter screen (Page 285).
2. Set MIDI OUT/THRU to Out.
3. Turn on the SysEx. Tx Sw ("SysEx Transmit Switch")—this determines whether or not SysEx data is transmitted from the VS-2400CD as you operate its controls.
4. MIXER CONTROL TYPE sets the type of messages generated by the VS-2400CD's controls. Set it to Excl so that the VS-2400CD generates SysEx messages.
   Every move you make on the VS-2400CD produces a SysEx message that's transmitted from the MIDI OUT/THRU jack to the external MIDI device.

You can record the SysEx data on a track in a sequencer you're synchronizing with the VS-2400CD, as discussed later in this chapter.

To receive SysEx Data from an external MIDI device:

1. Using a MIDI cable, connect the VS-2400CD MIDI IN jack to the MIDI OUT jack of the device from which you want to receive SysEx data.
2. Navigate to the MIDI parameter screen (Page 285).
3. Turn on SysEx. Rx Sw so that the VS-2400CD responds to received SysEx data.

Changing Scenes via MIDI

You can send the VS-2400CD Program Change values on MIDI Channel 16 to recall scenes in the current project. Program Change Numbers 00-99 recall Scenes 00-99.

The VS-2400CD can't switch scenes while its hard disk recorder is playing back. When it receives a Program Change on MIDI Channel 16 during playback, playback pauses, the requested scene is recalled, and playback then resumes.

Received Program Changes on MIDI Channel 16 are ignored during recording.

Changing Effect Patches via MIDI

You can remotely select effect patches by sending the VS-2400CD the appropriate Bank Select and Program Change messages on the effect's MIDI channel. Effects 1-4 respond to messages received on MIDI Channels 1-4, respectively.

Bank MSB (C.C. 0):	*Bank LSB (C.C. 32):*	*Program Change Numbers:*	*Selects Patches:*
0	0	0-99	Preset 000-099
0	1	0-99	Preset 100-199
0	2	0-39	Preset 200-239
0	3	0-99	User 000-099
0	4	0-99	User 100-199

You can change effect patches using program changes sent to the VS-2400CD when the hard disk recorder is playing, recording or stopped.

Remote Control of the VS-2400CD with Control Change Messages

You can set a variety of VS-2400CD parameters from a remote MIDI device by sending the VS-2400CD Control Change messages. These include:

- input, track, FX return channel parameters
- MASTER and MONITOR bus parameters
- Aux and Direct path parameters
- effect parameters

You can also send the VS-2400CD Control Change messages to set its hard disk recorder's TRACK STATUS buttons.

Certain important parameters have their own Control Change numbers. You can set one of these parameters by simply sending the VS-2400CD the desired value for the parameter's Control Change number. For a list of the MIDI channels used by the input, track, FX return channels and Master Edit area—as well as charts of Control Change numbers and the parameters they set—see "MIDI Channels and Control Change Maps" on Page 460.

Other parameters—such as effect parameters—can be adjusted using NRPNs, a special category of Control Change messages. For details on using NRPNs for editing effects and other parameters, see the MIDI Implementation section of the *VS-2400CD Appendices*.

When you adjust these parameters on the VS-2400CD itself, the VS-2400CD can transmit Control Change values that can be recorded in an external MIDI device and then sent back to the VS-2400CD as desired.

To enable Control Change transmission on the VS-2400CD:

1. Using a MIDI cable, connect the VS-2400CD's MIDI OUT/THRU jack to the external device's MIDI IN jack.
2. Navigate to the MIDI parameter screen (Page 285).
3. Set MIDI OUT/THRU to Out.
4. Set MIXER CONTROL TYPE to C.C. ("Control Change").

To enable Control Change reception on the VS-2400CD:

1. Using a MIDI cable, connect the VS-2400CD's MIDI IN jack to the external device's MIDI OUT jack.
2. Navigate to the MIDI parameter screen (Page 285).
3. Set MIXER CONTROL TYPE to C.C. ("Control Change").
4. If you want to edit effects using NRPNs, turn on the EFFECT C.C. Rx Sw ("EFFECT Control Change Receive Switch") parameter.

Remote MIDI Storage of VS-2400CD Settings

You can transmit scenes, EZ Routing templates and user effect patches from the VS-2400CD as SysEx bulk dump data that can be stored in an external MIDI storage device—or a sequencer—and loaded back into the VS-2400CD at a later time. The VS-2400CD's bulk dump operations are performed on its MIDI BULK DUMP screen.

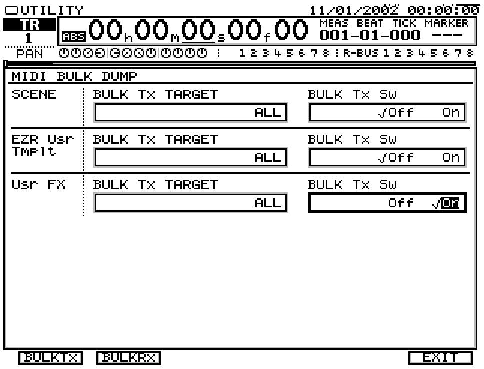
Bulk-dumping scene, EZ Routing or effect patch data doesn't remove it from the VS-2400CD's memory. It merely allows you to store a copy of the data externally.

In order to transmit MIDI bulk dump data, the SysEx. Tx Sw parameter on the MIDI PARAMETER screen (Page 285) must be turned on. To receive bulk dump data, the SysEx. Rx Sw parameter on the same screen must also be turned on.

To ensure the successful re-loading of bulk dump data, read "A Note About SysEx ID Numbers" on Page 286.

Sending SysEx Bulk Dump Data

1. Using a MIDI cable, connect the VS-2400CD's MIDI OUT/THRU jack to the device to which you want to transmit the SysEx bulk dump.
2. Navigate to the MIDI PARAMETER screen ((Page 285).
3. Set MIDI OUT/THRU to Out.
4. Press F5 (BlkDmp)—the MIDI BULK DUMP screen appears.



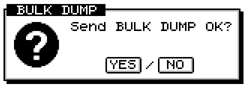
MIDI BULK DUMP

SCENE: BULK Tx TARGET ALL; BULK Tx Sw √Off On
EZR Usr Tmplt: BULK Tx TARGET ALL; BULK Tx Sw √Off On
Usr FX: BULK Tx TARGET ALL; BULK Tx Sw Off √On

When you bulk-dump data from the VS-2400CD, all data selected for transmission on this screen is included in the dump. Therefore, you'll need to select what you want to transmit in the dump. The screen is divided into three parts: SCENE, EZR Usr TMplt ("EZ Routing User Templates") and Usr FX ("User Effect Patches"). Each section has a BULK Tx ("Bulk Transmit") Sw on/off parameter, and a BULK Tx TARGET ("Bulk Transmission Target") parameter.

5. To include scene data in the dump, turn on the SCENE section's BULK Tx Sw.
6. Set the SCENE section's BULK Tx TARGET parameter to:
   - *ALL*—to include all of the current project's scenes in the dump.
   - *(Scene XX)*—to select a single scene to dump.

7. If you want to include EZ Routing user template data in the dump, turn on the EZR Usr Tmplt section's BULK Tx Sw and select a single EZ Routing template or ALL templates for its BULK Tx TARGET parameter.
8. To include one or all of your user effect patches, turn on the Usr FX section's BULK Tx Sw parameter and set its BULK Tx TARGET to ALL or a selected user effect patch.
9. When you've configured the contents of the bulk dump, press F1 (BULKTx) for "Bulk Transmit."
   The VS-2400CD asks if you're sure you want to transmit the bulk dump.



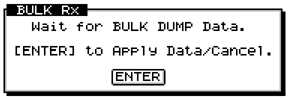
Send BULK DUMP OK?

10. Press ENTER/YES to transmit the SysEx bulk dump, or EXIT/NO to cancel the operation.
    A progress bar appears on the screen as the dump occurs. When the dump is complete, the VS-2400CD displays "Done!"

Receiving SysEx Bulk Dump Data

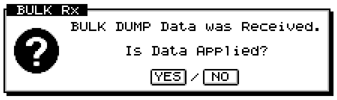
When you reload a scene, EZ Routing template or user effect patch, it's restored to its original memory location in the VS-2400CD, replacing anything that's currently stored there. Before receiving bulk dump data, make sure the memory locations you'll be loading data into don't contain anything you want to keep—if they do, re-save their current contents to new memory locations before proceeding.

1. Using a MIDI cable, connect the VS-2400CD's MIDI IN jack to the MIDI OUT of the device from which you want to transmit the SysEx bulk dump.
2. Navigate to the MIDI PARAMETER screen ((Page 285).
3. Press F5 (BlkDmp)—the MIDI BULK DUMP screen appears.
4. Press F2 (BULKRx) for "Bulk Receive."
   The VS-2400CD tells you it's awaiting the bulk dump data.



Wait for BULK DUMP Data.
[ENTER] to Apply Data/Cancel.

5. If you wish to cancel the operation at this point, press ENTER/YES.
6. When the data has been received, press ENTER/YES.
   The VS-2400CD asks if you wish to restore the data to its original scene, EZ Routing template and/or user effect patch memory locations.



BULK DUMP Data was Received.
Is Data Applied?

7. Press ENTER/YES to restore the data, or EXIT/NO to cancel the operation.

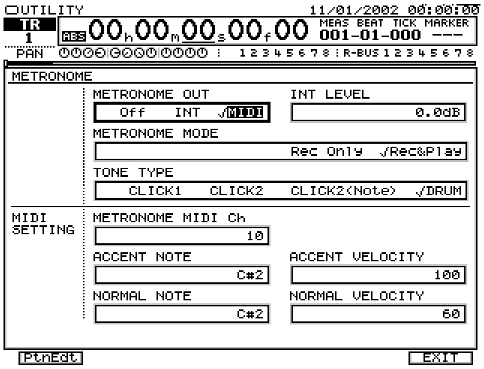
MIDI Metronome

The VS-2400CD has a full-featured internal metronome that allows you to create several types of reference rhythms during recording and playback—see Page 361. The metronome can also send its MIDI notes to an external MIDI sound module or keyboard, allowing you to use the module's sounds for your reference rhythm.

Setting Up a MIDI Metronome

Prepare the external MIDI device that'll be producing your metronome sounds by configuring it to receive data on a MIDI channel of your choice, and by selecting a rhythm kit-type sound that plays a different percussion sound on each note.

1. Using a MIDI cable, connect the VS-2400CD's MIDI OUT/THRU jack to the MIDI IN jack of the device whose sounds you want to use as a metronome.
2. Navigate to the MIDI parameter screen (Page 285).
3. Set MIDI OUT/THRU to Out.
4. Press F6 (EXIT).
5. Press PAGE once.
6. Press F2 (Metro)—the METRONOME screen appears.



UTILITY 11/01/2002 00:00:00

METRONOME

METRONOME OUT: Off INT √MIDI

INT LEVEL: 0.0dB

METRONOME MODE: Rec Only √Rec&Play

TONE TYPE: CLICK1 CLICK2 CLICK2(Note) √DRUM

MIDI SETTING

METRONOME MIDI Ch: 10

ACCENT NOTE: C#2

ACCENT VELOCITY: 100

NORMAL NOTE: C#2

NORMAL VELOCITY: 60

7. Set METRONOME OUT to MIDI.
8. Set METRONOME MIDI Ch to the MIDI channel on which the external MIDI device is set to receive data.

   The metronome can play two types of notes. It can play:

   - *accent notes*—that signify the start of each measure to help you keep track of where you are.
   - *normal notes*—that play on each measures' other beats. This note typically has a lower pitch than the accent note.
9. Select the desired accent note on your external MIDI device by setting ACCENT NOTE to its MIDI note number.
10. Select the desired normal note by selecting its MIDI note number for the NORMAL NOTE parameter.

    It's customary for the accent note to be somewhat louder than the normal notes—this loudness is determined by the note's MIDI velocity value.
11. Once you've had a chance to hear your MIDI metronome, you may want to adjust the ACCENT VELOCITY and NORMAL VELOCITY parameters to set a pleasing volume balance between the two types of notes.

Synchronization

Why Sync the VS-2400CD?

The ability to synchronize the VS-2400CD—specifically, its hard disk recorder—with other devices can be useful in a variety of situations.

Working with a MIDI Sequencer

You can sync the VS-2400CD to any kind of sequencer—a standalone hardware sequencer, a computer sequencing program or the sequencer in a beat box. Live stage productions with sequencer-driven lighting cues can also be synchronized to house sounds generated by the VS-2400CD.

In music, synchronizing the VS-2400CD with a sequencer allows you to record MIDI instruments as audio on the VS-2400CD's tracks. It also lets you create a finished musical work without *ever* recording your MIDI instruments as VS-2400CD tracks, perfecting your sequenced tracks as you listen to them alongside your recorded VS-2400CD tracks. The sequencer can play its MIDI instruments live through the VS-2400CD's input channels during the final mixdown.

As described earlier in this chapter, you can record all of your VS-2400CD actions into a sequencer as SysEx data, and have the sequencer play them back during a project. A sequencer can also adjust VS-2400CD parameters in realtime using Control Change messages (Page 289) as a project plays or during recording.

Working with a Video or Film Editing System

Since you can synchronize the VS-2400CD to any system that uses MTC or SMPTE synchronization (described later in this chapter), The VS-2400CD can be a great asset in video or film soundtrack, commercial spot production or post-production work.

Synchronization lets you place the musical scores, narration or sound effects you've recorded on the VS-2400CD perfectly to picture, thanks to the VS-2400CD's accurate frame/subframe synchronization precision.

The VS-2400CD's V-Link feature allows you to easily synchronize the VS-2400CD with video editing and presentation devices. See Page 303.

Basic Synchronization Concepts

Master/Slave

When two devices are synchronized with each other, one device is always designated as the "master" and the other the "slave," as we mentioned back in Chapter 9 in the discussion of digital audio's master clocking. In synchronization, the:

- *master*—generates the timing reference that both devices use.
- *slave*—operates using the master's timing reference.

The VS-2400CD can operate as master and/or slave, depending on the situation, as described in the following sections.

What Do We Mean By “Timing Reference?”

A timing reference is a kind of message continuously transmitted from master to slave to keep the devices synchronized. The VS-2400CD works with two types of timing references when synchronizing its hard disk recorder with another device.

SMPTE/MTC

The film and video industries use a steady stream of timing data called “SMPTE time code” to keep devices tightly synchronized with each other as they play. A form of SMPTE called “MIDI Time Code,” or “MTC” can be transmitted and received through MIDI cables along with other MIDI data. Both SMPTE and MTC provide very accurate synchronization. The time code area of the VS-2400CD’s current time location display (Page 122) shows MTC/SMPTE hours, minutes, seconds frames and subframes.

The VS-2400CD can be synchronized to any device that generates either SMPTE or MTC. Since most VS-2400CDs are used with MIDI devices, MTC is used more frequently than SMPTE. Most sequencers support MTC, for example—not as many support SMPTE. The VS-2400CD itself generates MTC.

MIDI Beat Clock

MIDI beat clock—or “MIDI Clock” for short—is a pulse embedded in a stream of MIDI data that can be used for synchronizing MIDI devices. MIDI clock synchronization isn’t as accurate as MTC-based synchronization. It does have one important use, however. MIDI clock, along with MIDI Song Position Pointer (“SPP”) messages, passes along tempo and time signature information that can be used by the VS-2400CD in the creation of sync tracks and tempo maps, which we’ll discuss in a moment.

The VS-2400CD can record received MIDI clock information as a sync track that lets it act as a master to slave devices that understand MIDI clocks and Song Position Pointer. While the VS-2400CD can generate MIDI clocks to slave devices that use this form of sync, the VS-2400CD itself can’t be synchronized to MIDI clocks, since it’s not an accurate enough form of synchronization for the VS-2400CD’s precise operations.

Song Position Pointer

About MTC/SMPTE Frame Rates

When you use MTC or SMPTE for synchronizing the VS-2400CD with an external device, you’ll need to make sure that the two devices are set to operate at the same MTC/SMPTE speed, called the “frame rate.” The “frame” refers to how many frames of film or video occur in each second.

MTC and SMPTE can run at a few different frame rates, depending on the devices being synchronized and the materials they’re producing. It can run at:

- *30 fps (‘frames per second”)*—This speed is used by most MIDI sequencers and audio devices. Black and white video also runs at this speed.
- *29.97N (“non-drop”) fps*—This is the speed at which United States’ NTSC format color video runs in non-time-critical situations, such as offline production work.
- *29.97D (“drop”) fps*—This is the speed at which United States’ NTSC format live color video runs during broadcasts and other time-critical situations.
- *25 fps*—This is the speed at which European SECAM or PAL film, video and audio equipment operates.
- *24 fps*—Film, cell animation and certain audio devices run at this speed.

What are Non-Drop and Drop Frame Rates?

When a time counter display tries to show the frames passing by at the 29.97 fps color video frame rate, it has a problem: The counter can't show exactly 29.97 counter numbers per second. It can either show 29 per second or 30, but there's no way to display only a fraction of a counter number—a number's either shown or it isn't.

A technique called the "drop frame" was devised by the video industry to deal with this. With a frame rate called "29.97 drop," the first two frames in every minute are discarded except for the first minute and every tenth minute. This keeps the time code and a counter roughly together. In fact, they're always a little bit off from each other, but each time the frames are dropped, the time code leaps ahead to catch up to the counter temporarily. This form of time code isn't completely continuous—since it has to keep skipping over frames to catch up—but it's useful in situations where the counter, and the clock on the wall, has to match the time code as closely as possible. It's therefore the most commonly used time code in the live broadcasting of color video.

29.97 non-drop time code is its continuous cousin. It doesn't drop any frames and is the preferred frame rate when the counter's accuracy doesn't matter so much. Continuous time code is theoretically smoother than time code that jumps around skipping frames.

Which Frame Rate Should You Use

If you're syncing and there's no video or film involved, use the 30 fps frame rate unless one of your devices doesn't support it. This frame rate's continuous and has the finest possible resolution, being the fastest speed available. If you're syncing the VS-2400CD to an external device that has to use another frame rate—for example, a video editing system—simply set the VS-2400CD to the frame rate the external device uses. We'll describe setting the VS-2400CD's FRAME RATE parameter in the following sections.

MMC

MMC, short for "MIDI Machine Control," is a set of MIDI messages that controls the transport buttons—PLAY, STOP, etc.—of an MMC-supporting device. MMC also contains information that tells each device the current location of its transport. In the VS-2400CD, this would be the position of its now line. MMC's not a form of sync—it's about button-presses: When you press the PLAY button on a master MMC device, an MMC slave device acts as if its PLAY button has been pressed as well. The VS-2400CD can act as an MMC master or slave.

In order for MMC to work, the master device's SysEx transmission must be enabled—in the VS-2400CD, this is the SysEx. Tx Sw parameter on the MIDI PARAMETER screen (Page 285). The slave device's SysEx reception must also be turned on. For the VS-2400CD, this is the SysEx. Rx Sw parameter, also on the MIDI PARAMETER screen.

Synchronization with Tempo Changes

It's not uncommon for a piece of music to use more than a single tempo or time signature. Since MTC/SMPTE speeds are unaffected by tempo or time signature, MTC/SMPTE time code doesn't contain tempo or time signature information. If you want a sequencer you're syncing to the VS-2400CD to speed up or slow down—or change time signatures—in order to follow what's recorded in a project, you can synchronize the two devices using MIDI clock and Song Position Pointers (Page 294).

The VS-2400CD can transmit this form of synchronization as a:

- *sync track*—a single, uneditable stream of MIDI clock/SPP synchronization data. The VS-2400CD can record a sync track comprised of captured MIDI clock and Song Position Pointer data received from an external MIDI device. This lets an external sequencer "teach" the VS-2400CD a song's tempo and time signature changes. The data can then be sent back to the sequencer, slaving it to the VS-2400CD. You can also construct a sync track for a new or already recorded project using markers. In addition, the VS-2400CD can use information you provide about an already recorded project to create a new sync track. See Page 297.
- *tempo map*—an editable stream of MIDI clock/SPP synchronization data. Each VS-2400CD project has its own a tempo map in which you can view and edit a project's tempo and time signature changes. You can build a tempo map for a new or already recorded project on the VS-2400CD manually or by using markers, or convert an existing sync track into a tempo map. For details, see Page 298.

The primary difference between a sync track and a tempo map in synchronization operations is that a tempo map lets you see and edit tempo and time signature changes.

A project's tempo map also provides the basis for the Home screen's track editing grid.

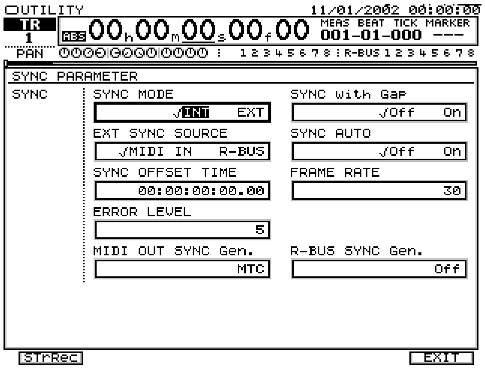
To synchronize an external MIDI device to the VS-2400CD using a sync track or tempo map, the device must recognize MIDI clock and Song Position Pointer messages.

The VS-2400CD has an area of memory set aside for a sync track—it isn't recorded on a project track and doesn't take up any recording tracks.

It's important to understand that a sync track or a tempo map has no effect on the speed at which a project plays back—this speed is determined by the project's sampling rate and its VARI PITCH setting, or by received MTC/SMPTE time code. A sync track and tempo map merely transmit tempo and time signature information that describes what's going on in a project to a MIDI device synchronized to the VS-2400CD.

The SYNC PARAMETER Screen

1. To set up synchronization, hold down SHIFT and press F4•UTILITY.
2. If "SYNC" isn't visible above F6, press PAGE until it is.
3. Press F6 (SYNC)—the SYNC PARAMETER screen appears.



SYNC PARAMETER

SYNC MODE: √INT EXT
EXT SYNC SOURCE: √MIDI IN R-BUS
SYNC OFFSET TIME: 00:00:00:00.00
ERROR LEVEL: 5
MIDI OUT SYNC Gen.: MTC
SYNC with Gap: √Off On
SYNC AUTO: √Off On
FRAME RATE: 30
R-BUS SYNC Gen.: Off

The SYNC AUTO parameter is actually available only when external sync is turned on—this illustration has been altered for instructional purposes.

4. Select the desired sync parameter and adjust its value.

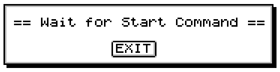
Some synchronization operations also involve parameters on the MIDI PARAMETER screen (Page 285).

Working with a Sync Track

Recording a Sync Track from an External Device

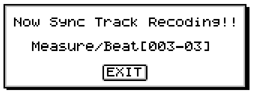
Prepare the external device that's supplying the sync track data by setting it to transmit MIDI clocks.

1. Using a MIDI cable, connect the VS-2400CD's MIDI IN jack to the MIDI OUT of the device from which you want to transmit the MIDI clocks.
2. Navigate to the SYNC screen (Page 296).
3. Press F1 (STrRec) for "SyncTrack Record"—the VS-2400CD tells you it's awaiting data.



== Wait for Start Command ==

As the VS-2400CD receives the incoming sync track data, its display shows what's being captured.

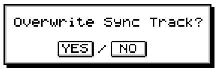


Now Sync Track Recoding!!
Measure/Beat[003-03]

If you want to interrupt and cancel the operation, press EXIT/NO. When the incoming data's been recorded, the VS-2400CD displays "Done!"

The VS-2400CD's now line doesn't move during sync track recording, nor do the project tracks play.

4. If you need to re-record the sync track, repeat Steps 1-3, and when the VS-2400CD asks if you want to overwrite the previously recorded sync track data, press ENTER/YES to proceed or EXIT/NO to cancel.



Overwrite Sync Track?

Generating a Sync Track from Markers

When a project contains music and uses a single time signature, you can create a sync track from markers placed on every beat in the project. To learn about placing markers, see Page 182.

1. Hold down SHIFT and press TAP—the TEMPO MAP screen appears.
2. Press F1 (TM Cnv) to display the TEMPO MAP CONVERT window.
3. Set CONVERT TYPE to Tap → SyncTrk.
4. Set BEAT to the desired time signature.
5. Set TAP BEAT to the number of markers in each measure.
6. Press ENTER/YES to convert the markers into a sync track, or EXIT/NO to cancel the operation.

Creating a Sync Track Automatically

When a project contains music and has a completely steady tempo and no time signature or tempo changes, the VS-2400CD can create a sync track from the project's start and end times, its time signature and the number of measures it contains.

You'll need to note the following before proceeding: the precise start and end times of the project's audio, the number of measures in the project, and its time signature.

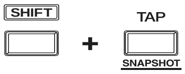
1. Hold down SHIFT and press TAP—the TEMPO MAP screen appears.
2. Press F1 (TM Cnv) to display the TEMPO MAP CONVERT window.
3. Set to CONVERT TYPE to Time → SyncTrk.
4. Set the START TIME parameter to the time at which the project's audio starts.
5. Set the END TIME parameter underneath it to the time at which the project ends.
6. Enter the number of measures and the project's time signature.
7. Press ENTER/YES to create the new sync track, or EXIT/NO to cancel the operation.

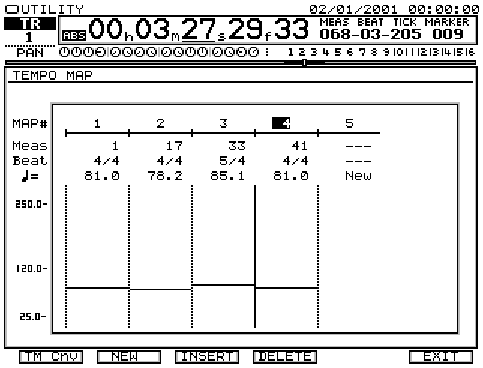
Working with a Tempo Map

The Tempo Map Screen

All editing of a project's tempo map takes place on the UTILITY menu's TEMPO MAP screen. You can also view a project's tempo and time signature details on this screen when you've generated a tempo map from a sync track or markers.

1. Hold down SHIFT and press TAP—the TEMPO MAP screen appears.





02/01/2001 00:00:00

TR 1 ABS 00h03m27s29f33

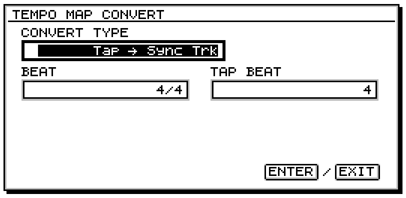
MEAS BEAT TICK MARKER 068-03-205 009

TEMPO MAP

MAP#	1	2	3	4	5
Meas	1	17	33	41	---
Beat	4/4	4/4	5/4	4/4	---
♩=	81.0	78.2	85.1	81.0	New

The TEMPO MAP CONVERT Window

When you press F1 (TM CNV)—for "Tempo Map convert"—on the TEMPO map screen, the TEMPO MAP CONVERT window appears.



TEMPO MAP CONVERT

CONVERT TYPE: Tap → Sync Trk

BEAT: 4/4

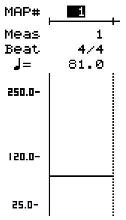
TAP BEAT: 4

In this illustration, the parameters for the operation that converts markers into a sync track are displayed.

On this screen—as we saw earlier in "Working with a Sync Track"—you can perform a variety of sync track and tempo map conversion operations. When you set CONVERT TYPE to the desired operation, the operation's parameters are displayed.

The Elements of a Tempo Map

A map


MAP# 1
Meas 1
Beat 4/4
♩= 81.0

In a tempo map, each tempo or time signature change in a project is represented by a group of parameters collectively called a "map." The maps are numbered starting with "1" in the order in which they occur in the project. A map contains the following parameters:

- *Meas ("Measure")*—the measure at which the map's settings take effect.
- *Beat*—the time signature at the start of the selected measure.
- ♩—the tempo, in BPM ("Beats Per Minute"), at the start of the selected measure.

At the bottom of each map is a graphic display of its tempo relative to the entire possible range of tempos, from 25 BPM to 250 BPM.

Map 1 shows the project's initial tempo and time signature and can't be deleted.

Shaping a Tempo Map By Hand

If you've only got a few tempo or time signature changes in a project, you can manually create an entire project tempo map on the TEMPO MAP screen (Page 298) by placing a map at every tempo or time signature change:

- Begin by editing the first map's parameters to reflect the project's starting tempo and time signature—there's usually no need to change Map 1's Meas parameter since it represents the project's starting tempo and time signature.
- Create additional maps at all of the locations in the project at which a tempo or time signature change occurs.
- Edit the maps' values as desired.

You'll need to determine the desired BPM tempo values for your project to construct an accurate tempo map, or to edit the tempos in an existing one.

You can also edit the individual maps in an already-created tempo map.

To:	*Do this:*
create a new map	Press F2 (NEW)
select a map	Cursor to its number or any of its parameters. When a map is selected, the line at its left edge darkens.
insert a new map after the currently selected map	Press F3 (INSERT)
Erase the currently selected map	Press F4 (DELETE)

To edit an existing map:

1. Cursor to the map's Meas parameter to move the map to a new location, and select the desired number of the measure at which you want to place the map.
2. Press ▼ and set the Beat parameter to the desired time signature.
3. Press ▼ and select the desired tempo for the map.

You can't move a map to the same measure as the previous map, or to an earlier measure.

Hold down SHIFT as you turn the Time/Value dial to move through BPM values in whole-BPM-number steps.

A project's audio rarely starts at Time 00h00m00s00f00, and when the tempo map starts, so will a sequencer slaved to the VS-2400CD. You can use the SYNC OFFSET TIME parameter on the SYNC PARAMETER screen (Page 296) to delay the start of the tempo map. Move the now line to the beginning of the project's audio, note the now line's time code location in the current time location display, and copy the time into the SYNC OFFSET TIME parameter's box.

Creating a Tempo Map from Markers

When a project contains music and has a single time signature, you can create a tempo map from markers you've placed on every beat. To learn about placing markers, see Page 182.

1. Hold down SHIFT and press TAP—the TEMPO MAP screen appears.
2. Press F1 (TM Cnv) to display the TEMPO MAP CONVERT window.
3. Set to CONVERT TYPE to Tap → Tempo Map.
4. Set BEAT to the desired time signature.
5. Set TAP BEAT to the number of markers in each measure.
6. Press ENTER/YES to convert the markers into a tempo map, or EXIT/NO to cancel.

Converting a Sync Track to a Tempo Map

When you've recorded a detailed sync track—one that contains tempo changes and uses a single time signature—from an external device, you can convert it into a project tempo map.

1. Hold down SHIFT and press TAP—the TEMPO MAP screen appears.
2. Press F1 (TM Cnv) to display the TEMPO MAP CONVERT window.
3. Set to CONVERT TYPE to Sync Trk → Tempo Map.
4. Set SYNC TRACK BEAT to the project's time signature.
5. Press ENTER/YES to convert the sync track into a tempo map, or EXIT/NO to cancel the operation.

Syncing an External Device to the VS-2400CD

The VS-2400CD can generate MTC or MIDI clocks that allow you to synchronize another device to the VS-2400CD, with the VS-2400CD as master and the external device as slave.

MIDI clocks are always carried to an external device through a MIDI cable. MTC, on the other hand, can be carried through a MIDI cable to a MIDI device, or through an R-BUS cable to a connected R-BUS device (Page 50). To learn how to set up R-BUS communication with the VS-2400CD, see "R-BUS Remote Control" on Page 441.

The following describes synchronizing a single device to the VS-2400CD. If you have a way of distributing VS-2400CD-generated sync—a MIDI patchbay can do this—you can slave multiple devices to the VS-2400CD as long as they're all capable of responding to the selected form of synchronization.

Setting Up the VS-2400CD as the Sync Master

1. Navigate to the MIDI PARAMETER screen (Page 285).
2. If the VS-2400CD is connected to the slave device with a MIDI cable, set MIDI OUT/THRU to Out. If you're using an R-BUS connection, skip this step.
3. If the device you're syncing to the VS-2400CD supports MMC (Page 295), turn on the SysEx.Tx Sw parameter and set MMC MODE to MASTER.
4. Hold down SHIFT and press EXT SYNC to jump to the SYNC PARAMETER screen.
5. Set SYNC MODE to INT, for "Internal" so that the VS-2400CD uses its own timing.
6. If you'll be using MTC, select a FRAME RATE value—see Page 294 for guidance.
7. If you'll be using MTC, and the material in the slave device doesn't begin at 00h00m00s00f00, enter its start time as the Sync OFFSET TIME parameter's value—when the VS-2400CD's project plays from the top, the slave plays from this location.
8. Select the type of sync you want the VS-2400CD to generate. If you're syncing to:
   - *a MIDI device that recognizes MTC*—set MIDI OUT SYNC Gen. to MTC.
   - *a MIDI device that recognizes MIDI clocks*—set MIDI OUT SYNC Gen. to MIDIClk ("MIDI Clock") if you want to synchronize the external device to a project tempo map. To synchronize the device to a sync track, select SyncTr.
   - *an R-BUS device connected to the R-BUS jack*—set R-BUS Sync Gen. to MTC.
9. Complete the setup by configuring the slave device so that it's set to:
   - use an external timing source.
   - receive the type of sync you're sending it from the VS-2400CD.
   - receive MMC if the device recognizes MMC.
   - receive SysEx data if the device recognizes MMC.

Consult the slave device's documentation for synchronization setup details.

Starting Synchronized Playback with the VS-2400CD as Master

1. Set the slave device—as detailed in its documentation—so that it's awaiting sync.
2. Press the VS-2400CD's PLAY button.
3. To halt synchronized playback, press STOP on the VS-2400CD.

Syncing the VS-2400CD to an External Device

The VS-2400CD can be synced to a master device that generates MTC. The VS-2400CD can receive MTC through its MIDI IN jack or through an R-BUS connection (Page 50).

For details on setting up successful R-BUS communication with the VS-2400CD, see "R-BUS Remote Control" on Page 441.

Setting Up the VS-2400CD as a Sync Slave

1. Navigate to the MIDI PARAMETER screen (Page 285).
2. If the master device transmits MMC (Page 295), turn on the VS-2400CD's SysEx. Rx Sw parameter, and set the MMC MODE parameter to SLAVE.
3. Set the MMC SOURCE parameter to:
   - *MIDI*—if the VS-2400CD is connected to the master device via MIDI.
   - *R-BUS*—if the master device is connected to the VS-2400CD's R-BUS jack.
4. Press F6 (EXIT) and then F6 (SYNC) to display the SYNC PARAMETER screen.

5. Set SYNC MODE to EXT, for "External" so that the VS-2400CD uses the master device's timing to operate.

If you prefer, you can wait until you're ready to start synchronized playback—hold down SHIFT and press EXT SYNC to activate the VS-2400CD's use of external sync.

The SYNC with GAP parameter determines how the VS-2400CD responds to small gaps, or "dropouts," that often occur in time code for a variety of reasons. Set it to:

- *Off*—if you want the VS-2400CD to stop if there's any gap in the time code.
- *On*—if you want the VS-2400CD to continue playing, or "freewheel," at the last synchronized speed until time code is again received.

6. Set EXT Sync SOURCE to the jack that's receiving time code from the master device. You can select MIDI IN or R-BUS.
7. Set FRAME RATE to the master device's frame rate.
8. If you've turned on external sync in Step 5, set SYNC AUTO to:
   - *Off*—so that the VS-2400CD uses its your FRAME RATE setting.
   - *On*—so that the VS-2400CD automatically resets its frame rate to that of the master device.

If you've chosen to turn on external sync later in Step 5, set SYNC AUTO once external sync has been activated—it can only be set once external sync has been turned on.

9. Set Sync ERROR LEVEL to adjust the VS-2400CD's tolerance of dropouts in the time code. Lower values make the VS-2400CD less tolerant of time code problems, causing it to cancel synchronization by stopping the VS-2400CD's hard disk recorder. Higher values make the VS-2400CD more patient with problems in the time code, giving it more time to recover before canceling synchronization.

The best setting for the both the SYNC with GAP and Sync ERROR LEVEL parameters is a personal judgement call. When SYNC with GAP is turned off and SYNC ERROR LEVEL is set to a lower value, you can be sure that your sync is rock-solid when synchronization is successful. On the other hand, it's more likely that synchronization will fail. If you turn SYNC with GAP on and use a higher Sync ERROR LEVEL value, it's more likely that synchronization will succeed, but it may not be as tight. You may need to experiment with various settings to find the one that's most satisfactory.

10. Complete the setup by configuring the master device so that it's set to:
    - send MTC to the corresponding VS-2400CD jack.
    - the same frame rate as the VS-2400CD.
    - generate MMC.
    - transmit SysEx data.

Consult the master device's documentation for synchronization setup details.

If the time code produced by the master device starts before 00h00m00s00f00—that is, it's a negative value—the project playback on the VS-2400CD pauses at 23h.59m.59s.29f.99. Be sure not to record any audio in the project at this time location.

Starting Synchronized Playback with the VS-2400CD as Slave

SHIFT
+
NUMERICS
EXT SYNC

1. If the VS-2400CD's EXT SYNC indicator (Page 45) isn't already flashing, hold down SHIFT and press EXT SYNC. This is the same as setting the SYNC MODE parameter to EXT (Page 301).
2. Press PLAY on the VS-2400CD—its indicator flashes green to indicate that it's awaiting external time code.

Sync-related parameters can't be adjusted while the PLAY indicator is flashing.

3. Start playback on the master device—the VS-2400CD follows suit. If you've shifted the project start time, the VS-2400CD now line jumps to the desired location.
4. To halt playback, stop playback on the master. If you've shifted the project start time, the VS-2400CD now line jumps to its actual MTC/SMPTE time code location.

Shifting the Project Start Time

It's not uncommon to be syncing a VS-2400CD project to material on a master device that doesn't begin at 00h00m00s00f00 MTC/SMPTE time. You might be syncing the project to a song somewhere in the middle of a digital tape, for example. When you begin playback, the VS-2400CD's now line shoots ahead to the same time location—the beginning of the material on the master starts in the middle of the VS-2400CD's project.

If you've already recorded at the beginning of your project, it won't play along with the master's material. If you haven't yet recorded on the VS-2400CD, any audio you record during synchronization will begin somewhere within the project. When you want to do unsynchronized work, you'll need to navigate to the middle of the project to begin playback each time instead of just being able to hit the ZERO button.

You can shift, or "offset," the project's start time to solve this problem so that whenever the master starts over, your project begins at the top. To offset the project start time:

1. Hold down SHIFT and press F4•UTILITY.
2. If "Proj" isn't visible above F3, press PAGE until it is.
3. Press F3 (Proj).
   The DISPLAY OFFSET TIME parameter shifts the project's start time. To find the value you want, subtract the desired project start time—this is typically 00h00m00s00f00—from the master's start time. Enter this amount as the DISPLAY OFFSET TIME.

Master start time
—desired project start time

DISPLAY OFFSET TIME

This formula is especially helpful if your project's audio starts somewhere other than zero. Use the location at which the audio begins as your desired start time. If you get a negative result, add 24.00.00.00.00 to the master's start time and do the math again.

4. Set the TIME DISPLAY FORMAT parameter to REL, for "Relative Time," so that the current time location display shows the project's shifted start time instead of ABS (absolute) MTC/SMPTE time during playback.

Synchronizing the VS-2400CD and Video Equipment

The V-Link feature lets you easily connect the VS-2400CD to video equipment, using sight and sound together as expressive performance elements. It:

- lets the VS-2400CD easily work with video editing and presentation devices.
- allows for the synchronization of the VS-2400CD and video equipment using MTC.

Syncing the VS-2400CD with a Video Editing Device

When you're editing video and using audio from the VS-2400CD, the video editing device acts as the sync master for both devices.

To set up the VS-2400CD:

1. Connect the video device's MIDI OUT to the VS-2400CD's MIDI IN, and connect the VS-2400CD's MIDI OUT to the video device's MIDI IN.
2. Press the VS-2400CD's V-LINK button so it lights. It notifies the video device that V-Linking is now active, and sets a variety of VS-2400CD parameters as follows:
   MIDI parameters:
   - *MIDI OUT/THRU*—is set to Out.
   - *SysEx.Tx Sw*—is set to On.
   - *MMC SOURCE*—is set to MIDI.

   SYNC parameters:
   - *SYNC AUTO*—is set to On.
   - *EXT SYNC SOURCE*—is set to MIDI IN

   AUTOMIX is also turned on.
3. Hold down SHIFT and press EXT SYNC to activate the VS-2400CD's use of external synchronization.

Designating an MMC Master

Once the sync master/slave relationship has been established as described above, you'll need to designate the MMC master—the machine whose buttons you'll press to control both devices. Either the VS-2400CD or the video device can act as master:

- I*f you want to use the VS-2400CD's transport buttons*—make sure that the VS-2400CD's MMC MODE parameter on the UTILITY menu's MIDI PARAMETERS page is set to Master, and that the video device is set to act an MMC slave (consult the video device's documentation for details).
- *If you want to use the video device's transport buttons*—make sure that the VS-2400CD's MMC MODE parameter on the UTILITY menu's MIDI PARAMETERS page is set to Slave, and that the video device is set to act as MMC master (consult its documentation for details).

Syncing the VS-2400CD with a Video Presentation Device

When you're presenting a series of video clips on a video playback device, the VS-2400CD acts as master for both devices. You can use the VS-2400CD's Automix feature to pre-program the clips to be played by the presentation device—see Page 327.

To set up the VS-2400CD:

1. Connect the video presentation device's MIDI OUT to the VS-2400CD's MIDI IN, and connect the VS-2400CD's MIDI OUT to the video device's MIDI IN.
2. Press the VS-2400CD's V-LINK button so it lights. It notifies the video presentation device that V-Linking is now active, and sets a variety of VS-2400CD parameters as follows:
   MIDI parameters:
   - *MIDI OUT/THRU*—is set to Out.
   - *SysEx.Tx Sw*—is set to On.
   - *MMC SOURCE*—is set to MIDI.

SYNC parameters:

- *SYNC AUTO*—is set to On.
- *EXT SYNC SOURCE*—is set to MIDI IN

AUTOMIX is also turned on.

The VS-2400CD's Automix feature selects banks of clips and triggers the desired clips on the video presentation device, so no MMC master or slave need be designated.

Exchanging Digital Audio Data During Synchronization

You can exchange digital audio between the VS-2400CD and its sync partner. You might, for example, want to move audio tracks from one V-Studio to another. To learn about digital connectors, see Page 50. To learn about clocking digital audio, see Page 128.

When the VS-2400CD is the Master

You can set its MASTER CLOCK parameter (Page 128) to INT to send digital audio to the slave device with the VS-2400CD controlling the audio's timing.

When the VS-2400CD is the Slave

You can receive digital audio from the master device by setting the VS-2400CD's MASTER CLOCK to EXT TIME CODE. The received digital audio's clocking is computed from, and controlled by, the master device's time code.

You can also send digital audio from the VS-2400CD to the master device by setting the VS-2400CD's MASTER CLOCK parameter to INT—with this setting, the VS-2400CD generates its own master clock based on the time code received from the master device.

24—Surround

The VS-2400CD can generate Surround mixes in three popular Surround formats, allowing you to place input, track or FX return channel signals anywhere in Surround's three-dimensional space. This chapter describes how to set up for Surround mixing on the VS-2400CD, and how to deliver output signals for Surround encoding.

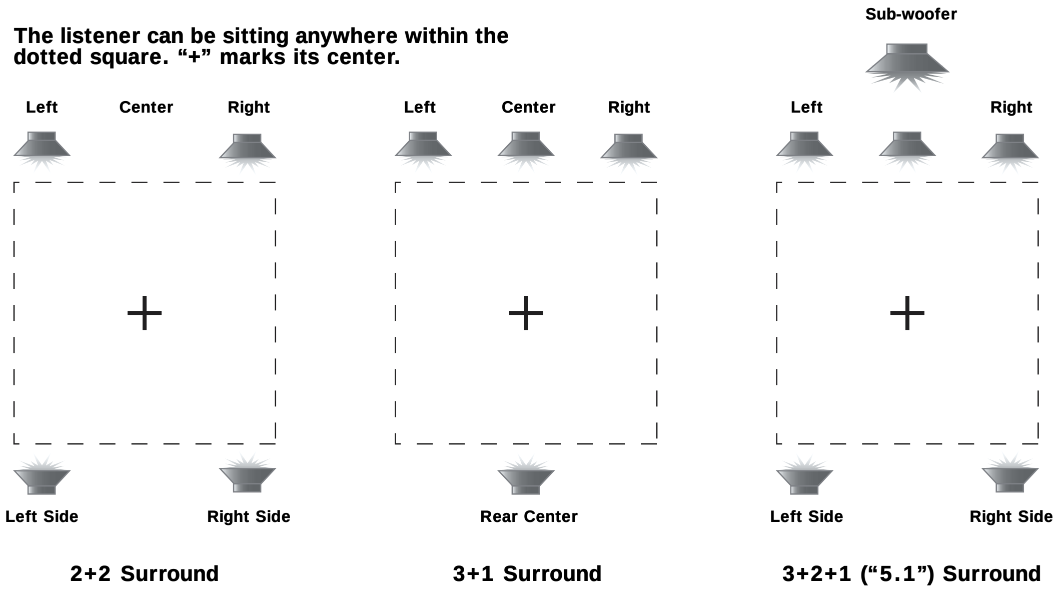
What is Surround?

In a conventional stereo system, audio is presented to the listener through two speakers: a left and a right speaker. Individual signals can be sent to one speaker or another in varying amounts, creating the illusion that the signal is occurring somewhere between the two speakers, in the two-dimensional, left/right stereo field.

Surround sound creates a three-dimensional—left/right and front/back—audio image using four to six speakers, depending on the Surround format. These speakers are placed in front of and behind the listener. While Surround is gaining popularity in private homes and live performance spaces, it's especially significant for its contributions to theatrical films—most mainstream movies employ Surround.

The VS-2400CD provides total control of signals' apparent positions in the three-dimensional Surround field.

Surround Formats


The listener can be sitting anywhere within the dotted square. "+" marks its center.
Sub-woofer
Left
Center
Right
Left
Center
Right
Left
Right
+
+
+
Left Side
Right Side
Rear Center
Left Side
Right Side
2+2 Surround
3+1 Surround
3+2+1 ("5.1") Surround

In Surround, the rear speakers are sometimes referred to as "side" speakers.

If you're not sure which Surround format you should use, check with the facility that'll be performing the Surround encoding, or with your client if you're doing a mix for hire. If you're mixing for yourself, use the format that utilizes your available speakers.

How the VS-2400CD Delivers Surround

When its Surround mode is active, the VS-2400CD assigns an Aux bus to each of the Surround speakers, or "stems," in the currently selected Surround format. Signals panned to a stem are automatically sent to its Aux bus.

The Aux busses are routed by default to the VS-2400CD's analog output jacks and digital connectors. You can re-route any of the Aux busses to other outputs if you wish—see Chapter 21 to learn how to set up the desired output routing.

On the CH EDIT screens, the Aux bus send controls for these busses are replaced by Surround position parameters. The busses' names change on the CH EDIT and EZ Routing OUTPUT screens to reflect their Surround roles.

2+2 Surround

Speaker/stem:	*Aux bus:*	*Analog output:*	*Digital output:*
Front left (L)	Aux 5	ANALOG MULTI OUTPUT 5	R-BUS 5
Front right (R)	Aux 6	ANALOG MULTI OUTPUT 6	R-BUS 6
Left side (Ls)	Aux 7	ANALOG MULTI OUTPUT 7	R-BUS 7
Right side (Rs)	Aux 8	ANALOG MULTI OUTPUT 8	R-BUS 8

3+1 Surround

Speaker/stem:	*Aux bus:*	*Analog output:*	*Digital output:*
Front left (L)	Aux 5	ANALOG MULTI OUTPUT 5	R-BUS 5
Front right (R)	Aux 6	ANALOG MULTI OUTPUT 6	R-BUS 6
Front center (C)	Aux 7	ANALOG MULTI OUTPUT 7	R-BUS 7
Rear center (RC)	Aux 8	ANALOG MULTI OUTPUT 8	R-BUS 8

3+2+1 (5.1) Surround

Speaker/stem:	*Aux bus:*	*Analog output:*	*Digital output:*
Front left (L)	Aux 3	ANALOG MULTI OUTPUT 3	R-BUS 3
Front right (R)	Aux 4	ANALOG MULTI OUTPUT 4	R-BUS 4
Front center (C)	Aux 5	ANALOG MULTI OUTPUT 5	R-BUS 5
Sub-woofer (SW)	Aux 6	ANALOG MULTI OUTPUT 6	R-BUS 6
Left side (Ls)	Aux 7	ANALOG MULTI OUTPUT 7	R-BUS 7
Right side (Rs)	Aux 8	ANALOG MULTI OUTPUT 8	R-BUS 8

You can connect the analog jacks or digital connectors to which the Surround Aux busses are routed to an external recorder for delivery to a production facility that does Surround encoding for theatrical or other commercial releases. You can also connect them directly to a Surround encoding device.

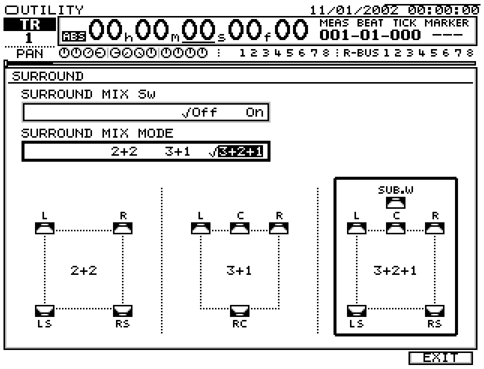
With an R-BUS DIF-AT interface (purchased separately) connected to one of the VS-2400CD's R-BUS connectors, you can transfer your Surround mix digitally to an ADAT or Tascam T-DIF recorder, popular devices used in Surround production facilities.

If you're creating a Surround mix for your own studio monitors—and don't need to Surround-encode the mix—you can connect the Aux busses' digital outputs to the inputs of Roland DS-90A or DS-50A Digital Reference Monitors, or the analog outputs to your standard monitor amplifiers' inputs.

Turning on Surround Mode

To create a Surround mix, you must be in Surround mode.

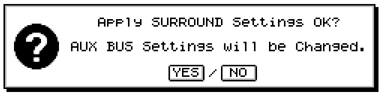
1. Hold down SHIFT and press F4•UTILITY.
2. If "Surrnd" isn't visible above F3, press PAGE until it is.
3. Press F3 (Surrnd) to view the SURROUND screen.



SURROUND MIX Sw: √Off On

SURROUND MIX MODE: 2+2 3+1 √3+2+1

4. Set SURROUND MIX MODE to the desired Surround format.
5. Turn the SURROUND MIX Sw parameter on. The VS-2400CD reminds you that it's about to re-configure your Aux busses, and asks if you're sure you want to switch to Surround mode.



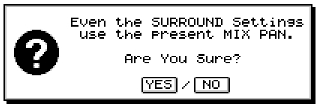
Apply SURROUND Settings OK?
AUX BUS Settings will be Changed.

This message also appears if you change Surround formats when Surround mode is already turned on.

6. Press ENTER/YES to proceed, or EXIT/NO to cancel the activation of Surround mode.

If you've got mixer settings you'd like to preserve, press EXIT/NO, save them as a scene and then activate Surround mode.

If you pressed ENTER/YES in Step 6, the VS-2400CD reminds you that your current channel panning settings will also be affected by the switch to Surround mode.



Even the SURROUND Settings use the present MIX PAN.
Are You Sure?

7. Press ENTER/YES to proceed, or EXIT/NO to cancel the change into Surround mode.

When you switch to Surround mode, connections are broken between any Aux busses required by the selected Surround format and the VS-2400CD's internal effects in order to prevent confusion. You can re-route the Aux busses to the effects if you wish (Page 280).

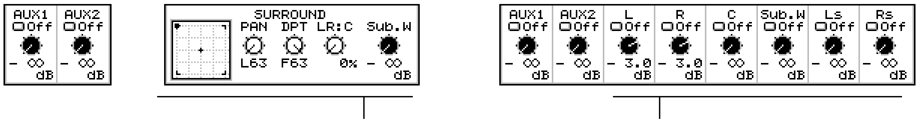
Certain parameter values change when you turn on Surround mode.

Parameter type:	*What Happens:*
Input and track channel CH EDIT parameters	• ChLink is turned off for any linked channels. • Surround placement controls replace the Aux bus send controls for any Aux busses used by the selected Surround format.
FX return channel CH EDIT parameters	• The ASSIGN parameter is turned off for any Aux busses used by the selected Surround format. • Surround placement controls replace the Aux bus send controls for any Aux busses used by the selected Surround format.
MASTER EDIT parameters	• The level controls of Aux busses used by the selected Surround format become Surround speaker master level controls. • If any Aux busses used by the selected Surround format are linked, they become unlinked.

Positioning a Signal in the Surround Field

Each input, track and FX return channel has its own Surround controls that let you place its signal at the desired location within the three-dimensional Surround field. You can position a channel's signal from its CH EDIT VIEW page, or from its dedicated CH EDIT SURROUND screen that presents a large graphic representation of the signal's Surround position.

1. Press the FADER button that selects the group of channels containing the one whose Surround position you want to set.
2. Press the desired channel's CH EDIT button.
   At the bottom of the CH EDIT VIEW screen, you see that Surround parameters have replaced the Aux bus send controls for the Aux busses used by the selected Surround format.



Input and track channels

AUX1 ☐Off - ∞ dB
AUX2 ☐Off - ∞ dB
SURROUND PAN L63 DPT F63 LR:C 0% Sub.W - ∞ dB

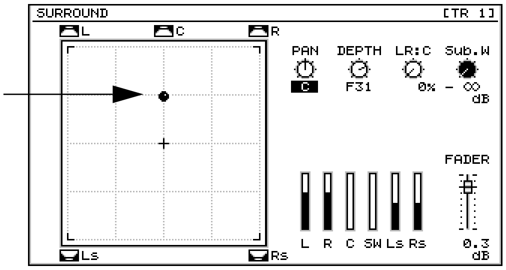
FX return channels

AUX1 ☐Off - ∞ dB
AUX2 ☐Off - ∞ dB
L ☐Off - 3.0 dB
R ☐Off - 3.0 dB
C ☐Off - ∞ dB
Sub.W ☐Off - ∞ dB
Ls ☐Off - ∞ dB
Rs ☐Off - ∞ dB

3+2+1 Surround position parameters

   These parameters are the same as those found on the channel's CH EDIT SURROUND screen—they're available here to provide a quick way to adjust a channel's Surround position as you work with its other CH EDIT parameters. We'll describe how the Surround parameters work in our discussion of the CH EDIT SURROUND screen.

3. If "Surrnd" isn't visible above F2, press PAGE until it is.
4. Press F2 (Surrnd) to view the CH EDIT SURROUND screen.



PAN C

DEPTH F31

LR:C 0%

Sub.W - ∞ dB

FADER 0.3 dB

Position ball

This illustration shows the CH EDIT SURROUND screen for 3+2+1 Surround.

The channel's output level. This is the same as moving the channel's fader or adjusting its CH EDIT FADER parameter.

The amount of signal sent from the channel to the Surround Aux busses.

The position ball shows the current Surround placement of the channel's signal.

5. Move the channel's signal to the desired location by dragging the position ball with your mouse, or by adjusting the:
   - *PAN*—to move the signal to the left or right. You can set PAN anywhere from L63—all the way to the left—to R63—all the way to the right.
   - *DEPTH*—to move the signal to the front or the rear. You can set DEPTH anywhere from F63—all the way to the front—to R63—all the way to the rear.

An even better way to perform Surround panning is to connect a Roland VE-7000 channel edit controller (purchased separately) and use its joystick to set each signal's Surround position.

When you're doing 3+1 or 3+2+1 Surround, the LR:C parameter allows you to set the amount of the channel's signal to be handed to the front center speaker. In stereo mixing, the center position is the result of an equal amount of signal being sent to the left and right speakers. In Surround, there can be a separate center speaker so that signals panned to the center are reinforced by their own speaker and have their own level control—this is Aux Bus 7 with 3+1 Surround, and Aux Bus 5 with 3+2+1 Surround.

6. Set the desired LR:C value from 0% to 100%:
   - *With 0%*—signals are positioned in the center between the left and right front speakers by sending an equal amount of signal to both speakers.
   - *With 100%*—signals panned to the center are handled completely by the center speaker.
7. When you're mixing 3+2+1 Surround, send the desired amount of the channel's signal to the front subwoofer by adjusting the Sub. W (for "SubWoofer") parameter's value.

Adjusting Master Surround Bus Levels

You can adjust the master level for each Surround stem. Since signal is carried to the stem using one of the VS-2400CD's Aux busses, simply move the Aux bus's master fader (Page 133) to adjust the stem's level. You can also change its level on the MASTER EDIT screen (Page 201).

25—Automix

This chapter describes how to perform automated mixing on the VS-2400CD using its Automix feature. Automix allows you to create and perfect automated mixes.

The Benefits of Automix

Automated Mixdown

Mixing is a challenging art, a delicate balance of attention to detail and artistic vision. It's both a creative and clerical activity in which your project is turned into a final work that can be heard by other people. It's the time when everything you've been meaning to tend to, and every enhancement you've been planning, has to be addressed. As such, there's a lot to get right. Mixing is really the project's final, ultimate performance.

Automix allows you to build up your mix, element by element, by recording each adjustment and perfectly playing it back. This lets you take your time, enjoying the process of crafting your project's final sound. Since Automix remembers what you do, you can work on a mix over a period of time—at the start of each mixing session, your project mix is exactly as you left it and ready to be worked on some more.

When you think you may be done with a mix, and are listening to it on different systems and playing it for friends and associates, Automix removes the worry that if you find something wrong in the mix you'll have to start all over. With Automix, you can fix any individual problems while preserving the rest of the mix.

Automated Recording

While most people use Automix during mixdown, you can also use it during recording, since you can automate input channel parameters. If you're recording something repeatable that requires changes during the course of the project—perhaps you're recording synchronized sequencer tracks—you can automate those moves and play them back as you're recording your tracks.

How Automix Works

How is Automix Recorded?

Automix captures and remembers changes made to a parameter's value over the course of a project, and remembers where each change occurs. What Automix records is Automix data, not audio data, and it's saved with the project. Automix records on its own tracks in its own area of the VS-2400CD's memory. It doesn't use any of your project's tracks. This means two important things:

- Using Automix doesn't reduce the number of available tracks in a project.
- Automix data is independent of audio data—you can alter either one without affecting the other.

Because Automix data and audio data are separate, when you move audio to a new location, you'll have to also remember to move the corresponding Automix data.

How Do Automix Tracks Work?

For every input, track, Aux bus and FX return channel there's a dedicated Automix track. When Automix mode is active, a channel's Automix track can capture or play back changes you make to its parameters. There are also Automix tracks for the MASTER bus, the Direct paths and for Effects 1-4.

Which Parameters Can be Automated?

Automix works with a wide array of input, track and FX return CH EDIT parameters, as well as important MASTER EDIT, Aux bus and Direct path parameters. For a list of the parameter values you can automate, see "Automix Parameter List" on Page 464.

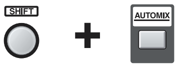
You can also automate most VS-2400CD actions with MIDI SysEx messages (Page 287). Automix is easier to work with since it doesn't require an in-depth knowledge of MIDI.

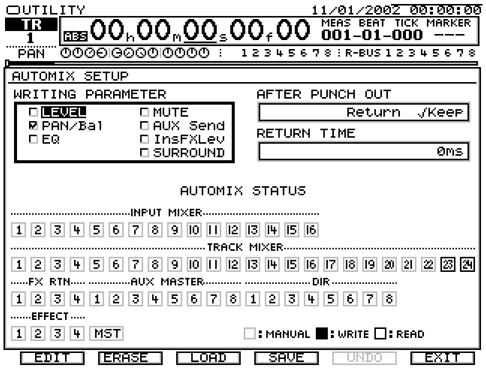
Automix also memorizes and plays back effect patch changes. When you select a new patch as the project plays—see Page 215—the new selection is captured by Automix.

The AUTOMIX Screen

Navigating to the Automix Screen

1. While holding down SHIFT, press AUTOMIX—the AUTOMIX screen appears.


SHIFT
+
AUTOMIX


UTILITY
11/01/2002 00:00:00
TR
1
ABS 00h00m00s00f00
MEAS BEAT TICK MARKER
001-01-000 ---
PAN
1 2 3 4 5 6 7 8 : R-BUS 1 2 3 4 5 6 7 8
AUTOMIX SETUP
WRITING PARAMETER
AFTER PUNCH OUT
RETURN TIME
AUTOMIX STATUS
INPUT MIXER
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
TRACK MIXER
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FX RTN
1 2 3 4
AUX MASTER
1 2 3 4 5 6 7 8
DIR
1 2 3 4 5 6 7 8
EFFECT
1 2 3 4 MST
☐: MANUAL ■: WRITE ☐: READ
EDIT
ERASE
LOAD
SAVE
UNDO
EXIT

☐ LEVEL
☑ PAN/Bal
☐ EQ
☐ MUTE
☐ AUX Send
☐ InsFXLev
☐ SURROUND

AFTER PUNCH OUT: Return √Keep

RETURN TIME: 0ms

We'll describe the AFTER PUNCH OUT and RETURN TIME parameters in our discussion of punching Automix data on Page 318. We'll describe F1 (EDIT) in "Editing Automix Data" on Page 320.

The WRITING PARAMETER Area

The WRITING PARAMETER area of the AUTOMIX screen shows various parameter groups. When a parameter group is checkmarked, changes made to its parameters are captured when you record Automix data, both in realtime (Page 318) and in Automix snapshots (Page 320). Check only the parameters you want to automate to streamline your Automix data and minimize visual clutter in the AUTOMIX EDIT screen.

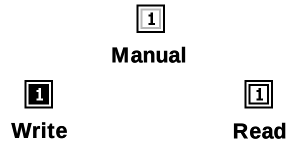
To toggle a WRITING PARAMETER group's checkmark on or off, turn the Time/Value dial to select the desired group and press ENTER/YES.

- LEVEL
- PAN/Bal ("Pan/Balance")
- EQ
- MUTE
- AUXSend
- InsFXLev ("Insert FX Level")
- SURROUND

The AUTOMIX STATUS Area

In the AUTOMIX STATUS area, select each Automix track and turn the Time/Value dial to set it as desired. The appearance of each Automix track's box shows you its current status.

The Automix track is set to:



An Automix track can be set to:

- *Manual*—so the corresponding input, track, Aux master or FX return channel, MASTER fader or Direct path doesn't use Automix. Its parameters are set manually.
- *Write*—so that the Automix track records changes made to the corresponding input, track, Aux bus or FX return channel, MASTER fader or Direct path.
- *Read*—so that the Automix track plays back its recorded Automix data.

You can also change the status of most Automix tracks using the AUTOMIX STATUS buttons, as described below.

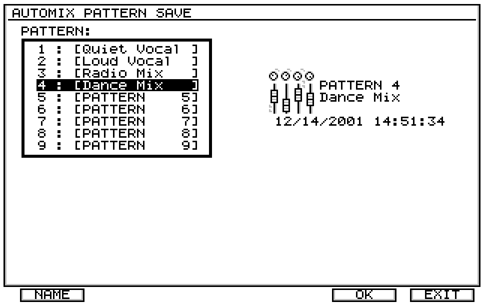
Saving and Loading Multiple Automixes

Each project can store up to nine separate, alternate Automixes, any one of which can be loaded at any time. With multiple Automixes available, you can:

- develop the perfect automated mixdown through multiple versions with the ability to return to an earlier version at any time by simply re-loading it.
- try out several Automix approaches to a project and pick the one you like best.
- Automix the same project in different ways for different uses.

To save an Automix:

1. Press F4 (SAVE)—the AUTOMIX PATTERN SAVE screen appears. It shows the nine memory locations into which Automixes (or Automix "patterns") can be saved.



```
AUTOMIX PATTERN SAVE
 PATTERN:
   1 : [Quiet Vocal ]
   2 : [Loud Vocal  ]
   3 : [Radio Mix   ]
   4 : [Dance Mix   ]
   5 : [PATTERN    5]
   6 : [PATTERN    6]
   7 : [PATTERN    7]
   8 : [PATTERN    8]
   9 : [PATTERN    9]

PATTERN 4
Dance Mix
12/14/2001 14:51:34
```

2. Highlight the memory location into which you want to save the current Automix.

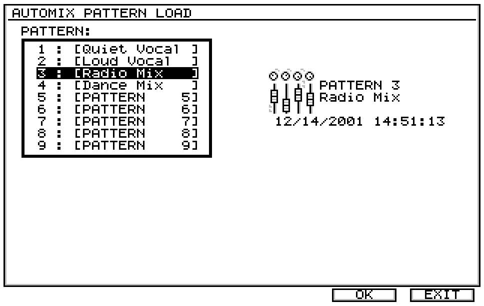
If you select a location that already contains an Automix, the Automix you're saving replaces the one that's already stored there.

3. Press F5 (OK)—the VS-2400CD asks "Save Automix Pattern?"
4. Press ENTER/YES to proceed or EXIT/NO to cancel the save.

To name a saved Automix, highlight it and press F1 (NAME). To learn how to use the VS-2400CD naming tools, see "Naming" on Page 71.

To load an Automix:

1. Press F3 (LOAD)—the Automix loading screen appears.



```
AUTOMIX PATTERN LOAD
 PATTERN:
   1 : [Quiet Vocal ]
   2 : [Loud Vocal  ]
   3 : [Radio Mix   ]
   4 : [Dance Mix   ]
   5 : [PATTERN    5]
   6 : [PATTERN    6]
   7 : [PATTERN    7]
   8 : [PATTERN    8]
   9 : [PATTERN    9]
                         PATTERN 3
                         Radio Mix
                        12/14/2001 14:51:13
```

2. Highlight the Automix you want to load.
3. Press F5 (OK)—the VS-2400CD asks “Load Automix Pattern?”

When you load an Automix, it replaces the currently loaded Automix. If you don’t want to lose your current Automix, makes sure to save it before loading a different one.

4. Press ENTER/YES to proceed or EXIT/NO to cancel the loading.

The F2 (ERASE) Button

To erase all of the currently loaded Automix data at once, press F2 (ERASE).

When you erase Automix data, you erase only the currently loaded Automix data. Any Automix you’ve saved remains intact and can still be loaded.

Activating Automix Mode

1. Stop project playback.
2. Press AUTOMIX—it lights solidly, but doesn’t flash, to show Automix mode is active.
3. To turn Automix mode off, press AUTOMIX again—its light turns off.

The AUTOMIX STATUS Buttons

When Automix mode is active, each CH EDIT/SELECT/AUTOMIX STATUS button can set the status of its corresponding Automix track.

For the remainder of this chapter, we’ll refer to these buttons as simply “AUTOMIX STATUS” buttons.

You can change the status of the MASTER bus, Direct path and effect patch Automix tracks only on the AUTOMIX screen.

Using the AUTOMIX STATUS Buttons

1. Press the FADER button for the group of channels containing the one that corresponds to the desired Automix track.
2. If Automix isn’t already solidly lit—press AUTOMIX.
3. While holding down AUTOMIX, press the desired AUTOMIX STATUS button. Each press changes the Automix track’s status, as reflected by the button’s lighting state.

If AUTOMIX STATUS is:	*Its Automix track is set to:*
off	Manual mode
flashing	Write mode
lit solidly	Read mode

The state of each AUTOMIX STATUS button is mirrored in the AUTOMIX STATUS area of the AUTOMIX screen—changing an Automix track's status in either place changes it in both.

Recording Automix Data

You can record Automix data two ways:

- *Realtime Automix*—Realtime Automix records changes you make to mix settings as the project plays. This method captures every subtle change you make, and is the best method to use when you're making constant adjustments to your parameter values over the course of a project. You can also punch in new parameter value changes in realtime.
- *Snapshot Automix*—Snapshot Automix, as its name suggests, captures your mix settings at a particular moment. Whenever the now line travels back to that moment when Automix is turned on, the snapshot's settings are instantly recalled. Snapshots are great for sudden changes to a mix—at the beginning of a solo, for example, when a guitarist's level has to be made louder. You can smooth the transition to a snapshot's settings using Automix GRADATION (Page 326).

You can use the two approaches for different parts of the same mix if you like.

In order to automate a parameter's value, its parameter group must be checkmarked in the AUTOMIX screen's WRITING PARAMETER area—see Page 314.

If you're working on a project that you'll turn into an audio CD, you'll eventually cut unwanted extra space off the front of the project. You can do this by trimming your mastering tracks. However, if you plan to trim the project before recording your mastering tracks, consider doing it before recording your Automix data so you don't have to move the corresponding Automix data after cleaning up the front of the audio.

Realtime Automix Recording

1. Press AUTOMIX to turn Automix mode on if AUTOMIX isn't already solidly lit.
2. Set the desired Automix tracks to Write mode in either of two ways. You can:
   - hold down AUTOMIX and press the AUTOMIX STATUS button for any input, track, Aux master or FX return channel you want to automate until AUTOMIX STATUS flashes to indicate that its Automix track is ready to record.
   - hold down SHIFT and press AUTOMIX to view the AUTOMIX screen, and set each Automix track you want to record to Write. You can change the status of the MASTER bus, Direct path and effect patch Automix tracks only on the AUTOMIX screen.
3. Press ZERO to rewind to the top of the project or move the now line to the location at which you want to begin recording Automix data.
4. While holding down AUTOMIX, press AUTOMIX REC—the AUTOMIX button flashes to show that Automix data can now be recorded.
5. Press PLAY and perform your mix—the changes you make are recorded onto the Write-enabled Automix tracks.

6. Press STOP when you're done—Automix recording is automatically turned off.
7. Change the status of the Automix tracks you've just recorded to Read mode by:
    - holding down AUTOMIX and pressing the AUTOMIX STATUS buttons for your automated input, track, Aux bus or FX return channels until they're lit solidly.
    - holding down SHIFT, pressing AUTOMIX, and setting each automated track to Read mode.
8. Press ZERO or move the now line to the location at which you started mixing.
9. Press PLAY to hear your automation—if you made changes to the positions of your faders during the writing of Automix data, you'll see them move during playback.
10. To re-do your automation—or to record new Automix data—repeat Steps 2-9.

Realtime Punching of Automix Data

You can re-record sections of your automated mix by punching in new Automix data on any Automix tracks that are set to Write mode.

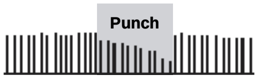
If you want to redo a section of automation at the very beginning of the project, use the recording procedure described on Page 317 and press STOP where you want the newly recorded automation to end.

Merging New and Old Automix Data

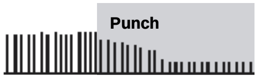
When you insert new Automix data by punching in on an Automix track, the AFTER PUNCH OUT parameter on the AUTOMIX screen lets you determine what happens to parameter values after you punch out. When you set it to:

- *Return*—parameters return to their previously recorded values after the punch-out.
- *Keep*—parameter values at the end of the punch-out remain in effect for the rest of the project, or until you perform another punch-in later in the project.

Punch with Return



Punch with Keep



Set AFTER PUNCH OUT to Return when you want to insert some Automix changes without affecting the rest of your automation data. Set it to Keep when you want the punch-in to change parameter values for the remainder of the project.

When you set AFTER PUNCH OUT to Return, the RETURN TIME parameter helps smooth the transition between the punch's final parameter values and those already recorded after the punch ends. You can set RETURN TIME to a value between 0ms and 1000ms—lower settings make transitions more abrupt.

If you decide at a later time that a punch-out transition is too noticeable, you can use the GRADATION Automix editing operation to smooth it out.

Automix offers two different ways to punch—you can use either method. The idea is to choose the method that requires the fewest button-presses for what you're doing:

- *AUTOMIX STATUS Button Punching*—Turn on Automix recording and toggle the desired Automix track(s) in and out of Write mode as the project plays.
- *AUTOMIX Button Punching*—Set the desired Automix tracks to Write mode, and toggle Automix recording on and off as the project plays.

AUTOMIX STATUS Button Punching

This punching method works best when you're punching bits and pieces of different Automix tracks as the project plays.

Make sure that the AUTOMIX STATUS button for each Automix track you don't want to punch is solidly lit so you don't accidentally erase its data as you punch on other Automix tracks.

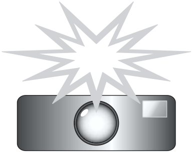
1. If the AUTOMIX button isn't lit solidly, press it so that it is, to signify that Automix mode is on.
2. While holding down AUTOMIX, press AUTOMIX REC—the AUTOMIX button flashes to show that Automix is recording.
3. Press ZERO or move the now line to a location shortly before the place you want the punch to start.
4. Press PLAY.
5. Hold down AUTOMIX, and at the location you want the punch to begin, press the desired Automix track's AUTOMIX STATUS button—its indicator flashes to show that you've punched in and are now recording Automix data.
6. Perform the new parameter changes you want to automate.
7. To punch out, hold down AUTOMIX and press the Automix track's AUTOMIX STATUS button again—its indicator lights solidly to show you've punched out.
8. Repeat Steps 6-9 for any other Automix track you want to punch as the project plays.
9. When you're done, press STOP—the AUTOMIX button stops flashing.
10. Make sure that all of your Automix tracks' AUTOMIX STATUS buttons are solidly lit so that they play back.
11. Press ZERO or move the now line to the desired location and press PLAY to hear your punched automation.

AUTOMIX Button Punching

This punching method works best when you're punching in and out on a group of Automix tracks at the same time, and there's not enough time to toggle their individual AUTOMIX STATUS buttons into and out of Write mode as the project plays.

1. If Automix isn't already turned on, press AUTOMIX so that it lights solidly.
2. Set the AUTOMIX STATUS button of each Automix track you want to punch so that it's red, ready to write new Automix data.
3. Press ZERO or move the now line to a location shortly before the place you want the punch to start.
4. Press PLAY.
5. Hold down AUTOMIX as you get close to the location where you want to punch in.
6. At the desired punch-in point, press AUTOMIX REC—the AUTOMIX button flashes to show you've that punched in and are now recording.
7. Perform the new parameter changes you want to automate.
8. To punch out, hold down AUTOMIX and press REC again—the AUTOMIX button stops flashing to show that you've punched out.
9. Repeat Steps 5-8 for any other sections of the project you want to punch as the project plays.
10. When you're done, make sure that all of your Automix tracks' AUTOMIX STATUS buttons are solidly lit so that they play back.
11. Press ZERO or move the now line to the desired location and press PLAY to hear your punched automation.

Snapshot Recording of Parameter Values



A snapshot registers the position of the now line and captures the current parameter values on all Automix tracks that are Write-enabled. When you play back the project with Automix turned on—and the Automix tracks set to play back—the parameter values stored in the snapshot are recalled when the now line reaches the location at which the snapshot was taken.

Taking a Snapshot

1. Move the now line to the location at which you want to take a snapshot.
2. If Automix isn't already turned on, press AUTOMIX so that it lights solidly.
3. Hold down AUTOMIX and press the AUTOMIX STATUS button for any Automix track whose settings you want to capture so that the button flashes to signify that the Automix track is in Write mode.
4. While holding down AUTOMIX, press AUTOMIX REC—AUTOMIX starts flashing to signify that it's ready to take the snapshot.
5. While holding down AUTOMIX, press TAP—the current parameter values for the Write-enabled tracks are captured in the snapshot.
6. Hold down AUTOMIX and press REC so that AUTOMIX lights solidly to show it's no longer ready to record.
7. Hold down AUTOMIX and press the AUTOMIX STATUS button for each Write-enabled Automix track to make it solidly lit for playback.

Playing Back Automix Data

To play back Automix data:

1. If AUTOMIX isn't lit solidly, press it so that it is to show that Automix mode is on. If it's flashing, hold down AUTOMIX and press REC so that AUTOMIX lights solidly.
2. Hold down AUTOMIX and set the AUTOMIX STATUS button for each of your Automix tracks to light it solidly so it plays back.
3. Play the project.

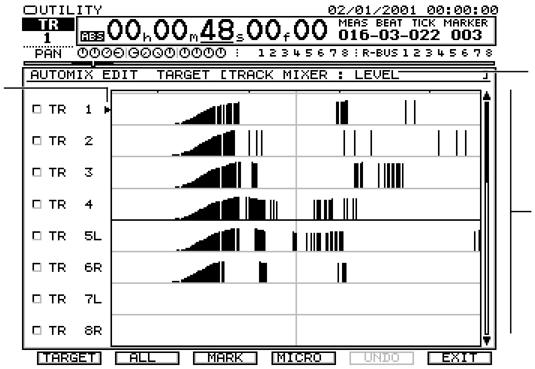
Editing Automix Data

Automix Editing Concepts

The AUTOMIX EDIT Screen

Automix editing takes place on the AUTOMIX EDIT screen. To get there:

1. While holding down SHIFT, press AUTOMIX.
2. Press F1 (EDIT)—the AUTOMIX EDIT screen appears.



When you cursor to an Automix track, and arrow appears to its left.

Currently targeted Automix data

Automix playlist

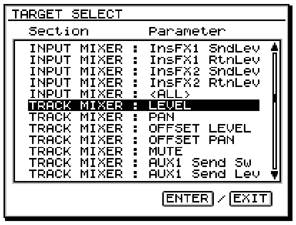
The AUTOMIX EDIT screen presents a playlist that shows the currently targeted Automix data—we'll explain targeting on the next page. Familiar Home screen tools appear at the top of the screen (Chapter 8). Edit-related F buttons are visible beneath the playlist. You can zoom in and out as desired.

Targeting Automix Data

Automix can record and play back more data than can possibly fit onscreen at once. Targeting allows you to select the Automix data and tracks you want to see and edit.

1. On the AUTOMIX EDIT screen, press F1 (TARGET)—the TARGET SELECT window appears.
2. Turn the TIME VALUE dial to highlight the desired target data.

When you select a target, you choose both the desired Automix track and the parameter whose Automix data you want to edit.



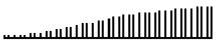
```
TARGET SELECT
   Section          Parameter
   INPUT MIXER :   InsFX1 SndLev
   INPUT MIXER :   InsFX1 RtnLev
   INPUT MIXER :   InsFX2 SndLev
   INPUT MIXER :   InsFX2 RtnLev
   INPUT MIXER :   <ALL>
   TRACK MIXER :   LEVEL
   TRACK MIXER :   PAN
   TRACK MIXER :   OFFSET LEVEL
   TRACK MIXER :   OFFSET PAN
   TRACK MIXER :   MUTE
   TRACK MIXER :   AUX1 Send Sw
   TRACK MIXER :   AUX1 Send Lev
                         ENTER / EXIT
```

3. Press ENTER/YES to select the new target data, or EXIT/NO to return to the AUTOMIX EDIT screen without changing the targeted Automix data.
4. If you pressed ENTER/YES in Step 3, the newly targeted Automix tracks and data appear in the playlist.

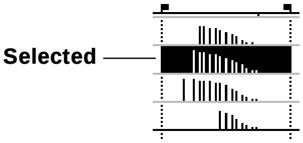
What Automix Data Looks Like

Every time you change a targeted parameter's value during Automix recording, the change is captured as an "Automix event." Each event appears as a vertical black line on the AUTOMIX EDIT screen's playlist—the higher the line, the higher the parameter value.

This illustration shows a level parameter's fade-in.



When Automix events are selected for editing on the AUTOMIX EDIT screen, they appear in reverse: an event is white, and its background is dark.



How Does Automix Editing Work?

Automix editing is very much like the region editing you perform on project audio tracks. You define a region by setting IN and OUT edit points, and you copy and move regions using FROM and TO. See Chapter 18 if you need to refresh your memory on the way region editing works.

F2 (ALL) and F3 (MARK)

As with audio region editing, to select the events on an Automix track that fall between the IN and OUT points, you must select the track. You can cursor to an Automix track and press ENTER/YES or F3 (MARK) to select it for editing—this places a checkmark to its left. To simultaneously toggle the selection of all of the displayed Automix tracks on or off, press F2 (ALL).

Automix Undo

Automix offers a single level of Undo for both Automix recording and editing. You can undo the most recent editing action until you perform another action. You can reverse the most recent Undo by performing a Redo until a new Automix recording or editing action is performed.

To undo the most recent Automix action, navigate to the AUTOMIX EDIT screen and press F5 (UNDO). To reverse the Undo, press F5 (REDO).

Automix Editing Methods

You can perform any Automix editing operation using your mouse or the VS-2400CD's buttons. Both operate much the same as they do in track editing.

Before editing Automix data, you must target the desired Automix tracks and the type of Automix data with which you want to work, as described on Page 321.

Automix Editing with the Mouse

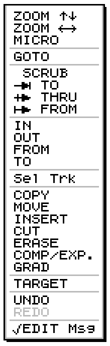
Select and edit Automix data using the usual region editing methods. You can:

- set edit points using the position line (Page 239).
- define an Automix region by dragging (Page 241).
- drag selected Automix data to move or copy it (Page 242).
- perform various operations using the Automix Pop-Up menu.

To learn more about editing with a mouse, see "Editing with a Mouse" on Page 238.

The SELECT TRACK Pop-Up menu used in audio region editing is not available for Automix editing.

In addition to many of the same items found in the Edit Pop-Up menu (Page 238), you'll find the following in the Automix Pop-Up menu:



- *MICRO*—opens the AUTOMIX MICRO EDIT window.
- *COMP/EXP. (Compress/Expand)*—allows you to lower or raise the value of selected automated parameter values. See Page 324.
- *GRAD (Gradation)*—helps smooth transitions between automated parameter values. See Page 326.
- *TARGET*—opens a dialog in which you can select the kind of Automix data you want to edit.

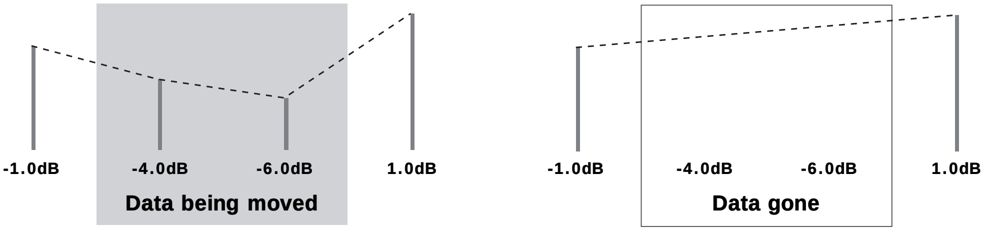
As with the Edit Pop-Up menu, you can hold down CLEAR and right-click to view options for deleting edit points, or hold down SHIFT to GO TO the desired edit point.

Automix Editing Operations

Since all Automix edit operations affect regions of Automix data, they all use the IN and OUT edit points. We'll note how FROM and TO are used where applicable.

About Moving and Deleting Automix Data

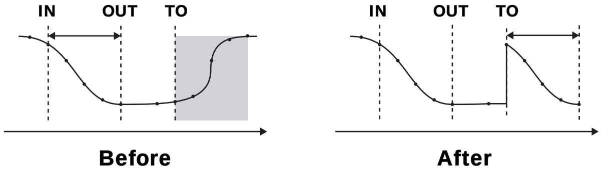
When you move or delete Automix data, the location from which you move or delete the data no longer contains its changes. What this means is that the value set by the final Automix event before the now-missing data stays in effect until the now line reaches the next event, after the missing data's original location.



This illustration shows how a Level parameter's values might change when Automix data is moved—the dotted line shows the resulting signal level.

COPY

You can copy Automix data from one part of a project to another, or from one Automix track to another. This allows you to re-use any chunk of automation at multiple locations in a project. This can be especially handy when the same section of audio—such as a chorus—appears more than once. When you perfect the automation for the section, you can re-use it each time it occurs in the project.



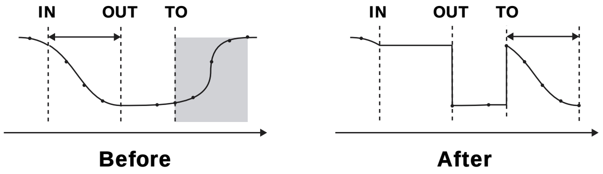
FROM is set to the same location as IN.

Edit point:	*What it does:*
FROM	sets the location of the Automix data region's time anchor
TO	sets the destination location for the time anchor

When you copy Automix data to a new location, it replaces any Automix data already present in the destination location.

MOVE

Automix MOVE allows you to move already-recorded Automix data to a new location on the same Automix track or to another Automix track. You'd most often use MOVE when you've changed the position of track audio and need to move its automation to the same location.



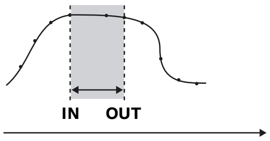
FROM is set to the same location as IN.

Edit point:	*What it does:*
FROM	sets the location of the Automix data region’s time anchor
TO	sets the destination location for the time anchor

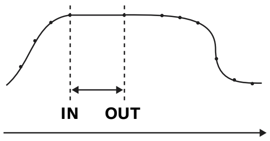
When you move Automix data to a new location, it replaces any Automix data already present in the destination location.

INSERT

Insert adds an area of blank space at the IN location equal to the length of the selected Automix region—all data at the IN point and onward is moved so that it starts at the end of the inserted blank space. When you’ve inserted empty space in an audio track, you’ll want to insert space in the accompanying Automix track as well so that your Automix events line up properly with their corresponding audio data.



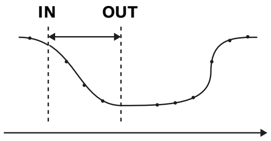
Before



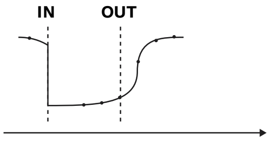
After

CUT

CUT deletes the Automix events between the IN and OUT points and moves the remaining data forward so that it starts at the IN point. You might cut Automix data when it occurs just a bit later than you want it to, or when you need to re-align it with audio you’ve moved forward in the project.



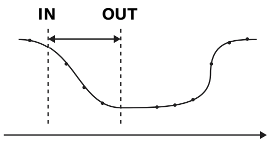
Before



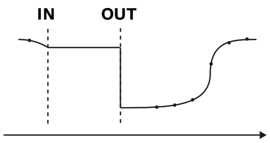
After

ERASE

Automix ERASE cleans out Automix events between the IN and OUT points. This can be useful when you’ve recorded parameter value changes you decide you don’t want, preferring to let an earlier parameter value remain in place until the OUT point.



Before

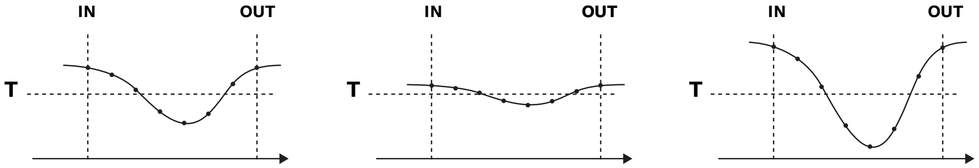


After

COMP/EXP.

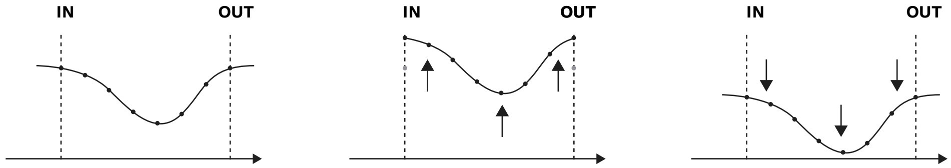
The Automix COMP/EXP. (“COMPRESS/EXPAND) edit operations allow you to lower or raise parameter values in the selected region. COMP/EXP. actually contains three separate operations:

- *Compression and Expansion*—change parameter values according to their distance from a specified threshold value (“T” stands for “Threshold” in the illustrations below). Use compression to make value changes in the selected Automix data region less extreme while retaining their basic character. Expansion makes the difference between your highest and lowest values more extreme.



Before **Compression** **Expansion**

- *Shift*—subtracts or adds a single specified amount to all parameter values in the selected region. You'd use Shift to simply raise or lower the selected values by the same amount.



Before **Positive Shift value** **Negative Shift value**

Parameter Value Percentages

The COMP/EXP. edit operations identify a parameter's values based on where they sit within the entire 100% range of the parameter's possible values. This allows you to identify the desired threshold value for compression/expansion, and helps you know how much shift to apply to an Automix region's parameter values, regardless of the kind of automated parameter you're working with.

Compression and Expansion

Compression and expansion decrease or increase, respectively, the distance between the region's parameter values and a threshold parameter value. You can select as your threshold any of the parameter's possible values, from 0 for its lowest value, to 50 for its middle value, to 100 for its maximum value. Set Expand to the amount by which you want to multiply the distance between the region's values and the threshold value. You can use:

- *Compression*—Expand settings less than 1.0 bring parameter values closer to the threshold value.
- *Expansion*—Expand settings greater than 1.0 increase the distance between parameters values and the threshold value.

Parameter values exactly equal to the threshold value are not changed by Compression and Expansion.

An Expand value of exactly 1.0 causes no change in the selected parameters' values.

Shift

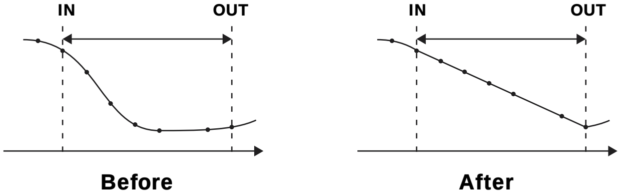
Shift allows you to raise or lower all parameter values in the selected region by a percentage of the parameter's entire range of values. You can set Shift anywhere from -50—which reduces the parameters' values by 50% of the parameter's entire range—to 50, which increases them by 50%.

You can shift a value only within its parameter's stated range. Once a parameter has reached its minimum or maximum value, Shift has no further affect on its value.

You can use Compression/Expansion and Shift together. The selected Automix data is compressed or expanded first, and then the Shift value is subtracted from or added to the resulting values.

GRADATION

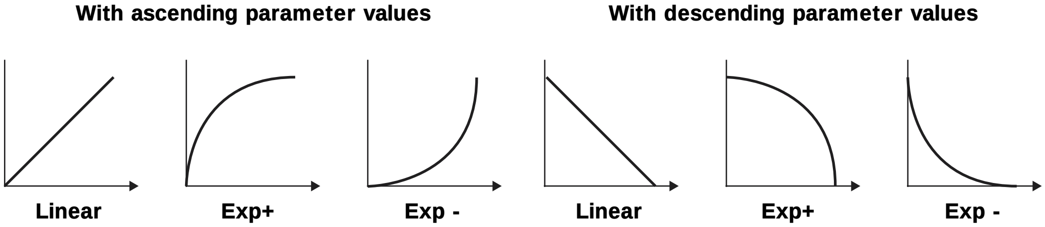
GRADATION smooths out Automix data in order to help make transitions between varying values sound more natural. It does this by forcing the selected Automix data to conform to a shape, or "gradation curve," you select.


IN
OUT
IN
OUT
Before
After

In this illustration, we've applied a Linear gradation curve.

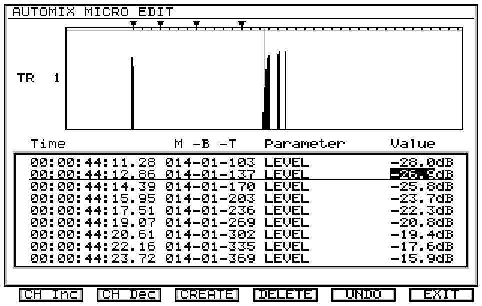
Set Gradation Curve to the desired shape. You can select:

- *Linear*—for a flat ascending or descending shape to the selected data.
- *Exp+*—for an upward convex exponential curve to the selected data.
- *Exp-*—for a downward convex exponential curve to the selected data.


With ascending parameter values
With descending parameter values
Linear
Exp+
Exp -
Linear
Exp+
Exp -

Micro-Editing Automix Data

On the AUTOMIX EDIT screen, press F4 (MICRO) to display the AUTOMIX MICRO EDIT screen.


AUTOMIX MICRO EDIT
TR 1
CH Inc
CH Dec
CREATE
DELETE
UNDO
EXIT

```
Time              M -B -T      Parameter     Value
00:00:44:11.28 014-01-103 LEVEL         -28.0dB
00:00:44:12.86 014-01-137 LEVEL         -26.9dB
00:00:44:14.39 014-01-170 LEVEL         -25.8dB
00:00:44:15.95 014-01-203 LEVEL         -23.7dB
00:00:44:17.51 014-01-236 LEVEL         -22.3dB
00:00:44:19.07 014-01-269 LEVEL         -20.8dB
00:00:44:20.61 014-01-302 LEVEL         -19.4dB
00:00:44:22.16 014-01-335 LEVEL         -17.6dB
00:00:44:23.72 014-01-369 LEVEL         -15.9dB
```

To leave the AUTOMIX MICRO EDIT screen, press F6 (EXIT).

On the AUTOMIX MICRO EDIT screen, you can individually edit the location and value of any Automix event. You can also delete any events you no longer want, and create new ones if you so choose.

Micro-Editing Automix Data

1. To view the desired Automix track's data, press F1 (Tr Inc) or F2 (Tr Dec) to move higher or lower, respectively, through the currently targeted Automix tracks. The current track's name and data is shown above the list of its Automix events.
2. Press ▲ or ▼ to select the desired event in the list, and:
    - *To change an Automix event's location*—Use ◀ and ▶ to select the desired unit of time measurement. You can select time code or measures/beats/ticks. Turn the TIME VALUE dial to select the desired start location.
    - *To change an Automix event's value*—Use ◀ and ▶ to highlight the event's value and turn the TIME VALUE dial to select the desired value.

You can see the changes you make in the data window above the phrase list.

Deleting an Automix Event

1. Press ▲ or ▼ to select the event in the list.
2. Press F4 (DELETE) to erase the selected Automix event.

Creating a New Automix Event

1. Press ▲ or ▼ to select an Automix event of the type you want to create.

If you can find an event at the desired location that's the same type of Automix event as the one you want to create, select it to save time.

2. Press F3 (CREATE) to place a copy of the currently selected Automix event at the selected event's location.
3. Edit the new Automix event's location and value as desired.

If you create a new event on an Automix track with no other events, the VS-2400CD creates a Level event.

Undoing an Automix Micro-Edit

1. Press F5 (UNDO). Until you record more Automix data or perform a new Automix edit, you can press F5 (REDO) to reverse the undo.

Automix and V-Link

V-Linking lets the VS-2400CD work seamlessly with video editing and presentation devices—see Page 303. The VS-2400CD's Automix feature allows you to program a series of video clips that a presentation device is to play.

You can insert V-Link Automix events into a project on the Automix MICRO EDIT screen described on the previous page. You can enter two types of V-Link Automix events at the desired project times:

- *BANK events*—select banks of video clips in the video equipment.
- *CLIP events*—trigger the playing of specific clips in the currently loaded clip bank.
- *ALL events*—that trigger all of the clips in a bank in sequential order.

To micro-edit a V-Link event, select it as an Automix editing target, as described on Page 321.

26—Mastering and CD-R/RW Operations

Mastering

Mastering is the process of turning your mix into a final, polished stereo recording, suitable for writing, or "burning," onto an audio CD for your private use or for mass-duplication. The VS-2400CD's Mastering Room and Mastering Tool Kit provide all the mastering tools you need.

Even if you just want to make a mix that you'll record onto a cassette for friends, the VS-2400CD's mastering tools can help you make the project sound its best.

You can also digitally transfer your mastered project to an external device—such as a DAT deck or computer—for storage, for further editing or for additional processing.

Mixing for Mastering

Take a few moments to check your project's tracks for noises—coughing, hum or unwanted notes—before you mix. Use your track editing tools (Chapter 18) to get rid of anything bothersome that you might forget to mix around.

While the VS-2400CD allows you to mix while you're mastering, we recommend that you perfect your mix before entering the Mastering Room. This way, you'll be able to more easily take advantage of the VS-2400CD's extensive suite of mixing tools. First and foremost are your track channel CH EDIT tools (Chapter 11) that let you shape each signal using dynamics processing and multi-band EQ. Handy tools such as fader grouping allow you to manage related groups of tracks with ease.

We also encourage you to use Automix (Chapter 25), which can transform the entire act of mixing. With Automix, you don't need to rehearse and rehearse tricky mix moves—just capture them once with Automix and you're done. The fact that you can record Automix data for a track at a time means that you can pay attention to mix details in a way that's just not otherwise possible.

Important Mastering Concepts

What Kind of Audio Can Be Burned on a CD

Only audio from a project that uses a 44.1k sampling rate can be written onto an audio CD. A project's sampling rate is chosen when a project is first created (Page 92). You can create a 44.1 kHz project using any VS-2400CD recording mode, but we recommend the MTP, CDR, MAS or MT1 recording modes for the best audio quality.

If your project uses a sampling rate other than 44.1 kHz, you can still master the project on the VS-2400CD and export the result as .WAV files to a computer for sample-rate conversion to 44.1 kHz—see "Exporting Tracks and Phrases as .WAV Files" on Page 346. You can then re-import the files into a 44.1kHz project and write your audio CD.

CD audio is recorded at a bit depth of 16 bits. If you've recorded a project at 24 bits, the VS-2400CD dithers its audio down internally to the required 16 bits during mastering—if you're using the CDR recording mode (Page 330)—or during CD burning.

Dither

What's Recorded on an Audio CD

It's important to understand that an audio CD contains just that: audio. None of your VS-2400CD's settings are written to an audio CD, only the audio that the settings produce. It's therefore critical that your final mix sound *exactly* as you want it to—with all of the desired tracks, effects, live elements and so on—since that's what the audio CD will contain.

An audio CD can hold up to about 74 minutes worth of audio.

What is the Mastering Room?

An audio CD contains just two tracks of audio: a left and a right track. Your project must therefore be mixed down to just two V-Tracks that can be burned onto a CD. On the VS-2400CD, these two V-Tracks are called your "mastering tracks." The Mastering Room is where you create mastering tracks.

With its normal MTP recording mode (Page 93), the VS-2400CD has a maximum of 24 tracks. When the Mastering Room is turned on, however, the VS-2400CD has *26* tracks: 24 normal project tracks plus the two mastering tracks.

The Mastering room has two operating modes. When it's set to:

- *Record*—You can listen to the signals from all of your input, track, Aux master and FX return channels as you record it onto your mastering tracks.
- *Play*—You can play back your recorded mastering tracks. Input, track, Aux master and FX return channel signals are silenced since their audio can now be heard in the final mix recorded on the mastering tracks.

About Mastering Tracks

The mastering tracks that contain your final mix are always a pair of V-Tracks that belong to Tracks 23 and 24. The 16th V-Tracks of Tracks 23 and 24 are selected as mastering tracks by default, but you can select any same-numbered pair of V-Tracks from Tracks 23 and 24 as long as they don't contain audio you want to include in your mix. We'll describe how to select the desired V-Tracks on Page 334.

If all of the V-Tracks for Tracks 23 and/or 24 already contain audio you don't want to lose, copy that audio to other V-Tracks to make room for your mastering tracks—mastering tracks can be recorded *only* on V-Tracks belonging to Tracks 23 and 24.

CD Disk Images

All commercially produced audio CDs conform to a set of standards called the "Red Book" standards. The VS-2400CD produces Red Book audio CDs.

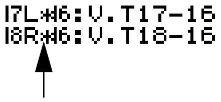
Before the VS-2400CD can burn audio onto a CD, it converts the audio into a Red Book-compliant form of data called a "disk image file," and stores the file on your internal hard drive. It’s this stereo file that actually gets written onto the CD. A disk image file can be as large as 700MB depending on how much audio you’re packing onto a CD.

The disk image file can be stored only on the VS-2400CD’s internal hard drive.

The VS-2400CD can use any free space on your hard drive for creating a CD disk image—the free space doesn’t have to be in the currently selected drive partition.

There are two times during the mastering process at which you can create a disk image file. You can:

- *record your mastering tracks using the CDR recording mode*—This records your mastering tracks as a disk-image file. When you save the project, the file is saved with it. If you want to create additional audio CDs at a later time, when you load the project, the disk image file loads as well, ready for burning.
- *create a temporary disk image on the fly as you burn a CD*—The VS-2400CD can create a temporary disk image file as you burn an audio CD if your mastering tracks weren’t recorded using CDR mode. This takes a bit longer and, as soon as you’re done burning CDs, the temporary disk image is discarded. If you want to burn more CDs at a later date, the VS-2400CD has to create another temporary disk image.



```
17L*H6:V.T17-16
18R*H6:V.T18-16
```

You can spot a CDR-recorded track by the asterisk in its name.

CDR-recorded audio is always stereo.

If an entire project is recorded in CDR mode—so each of its audio files is a disk image file—you can burn any pair of its tracks to an audio CD without using the Mastering Room’s tools.

Multi-Project Compilation CDs

Many VS-2400CD users treat each song—or other type of audio creation—as a separate project. When you want to create a CD from multiple projects, you’ve got to bring all of the audio from those projects together onto a single pair of mastering tracks. There are a few ways to do this.

Imported Mastering Tracks

Probably the best method is to mix and master each project separately using the CDR recording mode, and then use Region IMPORT (Page 267) to import all of their mastering tracks into a single CDR-mode compilation project. You can then do either of two things. You can:

- *edit them into the desired order*—Each imported set of mastering tracks appears as a pair of phrases in the playlist. It’s a simple matter to use phrase editing to copy them all to the same pair of tracks and move them into the desired positions with the desired spacing between each pair of phrases. The compilation project thus presents the contents of the audio CD from start-to-finish on the same pair of tracks. By investing some editing time, you can create an edited set of CDR-recorded tracks that can be burned immediately onto an audio CD.
- *master them one-by-one*—You can place the imported mastering tracks on any V-Tracks you want, and then build a new CDR-mode mastering track selection-by-selection (see “Building Mastering Tracks Selection-by-Selection” on Page 334). This method requires less editing time, but means that you have to re-master all of your elements in order to combine them.

Using Project COMBINE

You can also use the Project COMBINE operation (Page 100) to combine all of the projects into a single compilation project. If you're doing a full-length CD, this project will be very large, and require lots of disk space. As with the first approach, you can edit each selection into position on the same pair of tracks—with 24 tracks to move, this can be a lot of work. A better idea is to leave them where they are and build your final mastering tracks one selection at a time.

To use PROJECT COMBINE, all of the projects must use the same recording mode.

Unless all of the projects were recorded in CDR mode, you'll need to create CDR-mode mastering tracks whether you edit your selections into the desired order or not.

Use an External Recorder

You can also record each project's mix on an external digital recorder and then re-record each one into a single CDR-mode compilation project on the VS-2400CD. You can then re-order your selections on a single pair of CD-ready tracks, or build your mastering tracks selection-by-selection.

Understanding CD Track Markers

When you play an audio CD, you can jump from song to song by entering the desired song's number. Each song, or individual selection, on a CD is technically called a "track." A CD can contain up to 99 tracks.

Don't be confused by the use of the word "track" here—a CD track is different from a track on the VS-2400CD. On the VS-2400CD, a track contains a single mono signal. On a CD, a track is a stereo audio selection or song.

A CD player identifies each of its tracks by the numbered CD track marker placed at the front of the track. When you create an audio CD, the VS-2400CD automatically places the first CD track marker at the start of the mastering tracks, at Time 00h00m00s00f00. As the VS-2400CD encounters each CD track marker in a project you're burning on a CD, it sends a command to the CD burner to move to its next-numbered track.

It's not possible to write a CD with track numbers in anything but normal numerical order, nor is it possible to skip track numbers.

When you're recording mastering tracks selection-by-selection, the Mastering Room can automatically write a CD track marker at the beginning of each new selection you record after the first one—see "Building Mastering Tracks Selection-by-Selection" on Page 334.

Once you've performed any editing you need to do on your finished mastering tracks, the final stage of mastering before you actually burn an audio CD is the placing of your remaining CD track markers in the desired positions. We'll describe how to do this on Page 338.

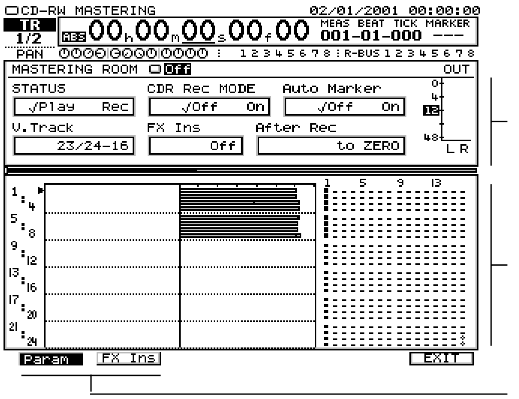
According to audio CD standards, CD track markers must be at least four seconds apart from each other. For this reason, every numbered track on a CD must be at least four seconds long. If you try to set CD track markers too close together, the VS-2400CD displays "Can't Set Marker."

Working in the VS-2400CD Mastering Room

Navigating to the Mastering Room

SHIFT
CD-RW MASTERING

1. While holding down SHIFT, press CD-RW/MASTERING. The MASTERING ROOM screen appears.


CD-RW MASTERING
02/01/2001 00:00:00
TR 1/2
ABS 00h00m00s00f00
MEAS BEAT TICK MARKER
001-01-000 ---
PAN
1 2 3 4 5 6 7 8 : R-BUS 1 2 3 4 5 6 7 8
OUT
0
4
12
48
L R
1 5 9 13
Param
FX Ins
EXIT

MASTERING ROOM Off

STATUS √Play Rec

CDR Rec MODE √Off On

Auto Marker √Off On

V.Track 23/24-16

FX Ins Off

After Rec to ZERO

Mastering room parameters

Project playlist

Navigation buttons

Turning On the Mastering Room

To turn on the Mastering Room:

1. Set the MASTERING ROOM on/off switch to On.
2. To de-activate the Mastering Room, set its switch to Off.

When the Mastering Room is turned on, the CD-RW/MASTERING button flashes.

Selecting the Mastering Room Operating Mode

The Mastering Room's operating mode is determined by the setting of its STATUS parameter. You can select:

- *Play*—to play back already recorded mastering tracks.
- *Record*—to record new mastering tracks.

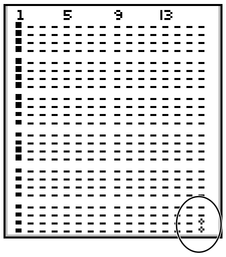
Selecting the Mastering Tracks' Recording Mode

When the CDR Rec Mode parameter is turned on, your mastering tracks are recorded as disk image files that can be immediately burned to an audio CD (Page 330). When it's turned off, the mastering tracks are recorded using the project's recording mode.

Typically, you'll want to set CDR Rec Mode to On. Set CDR Rec mode to Off when you need to master your mix in stages to get the most from limited effect resources, as described in "Stretching Effects" on Page 336.

When you're mastering a project that was recorded using CDR mode, the CDR Rec Mode parameter's value makes no difference—the mastering tracks are recorded using CDR mode in any event.

Selecting the Mastering V-Tracks



Turn the Time/Value dial to select the V-Tracks on which you want to record your mastering tracks. You can select any same-numbered pair of tracks belonging to Track 23 and 24, (Page 330).

The currently selected mastering tracks appear as diamonds in the V-Track map shown in the Mastering Room and elsewhere.

Building Mastering Tracks Selection-by-Selection

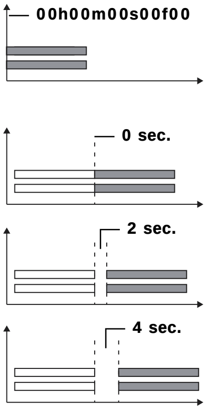
When you're creating an audio CD with multiple audio selections—such as an album of songs or a collection of jingles or soundtrack cues—you can record its mastering tracks one selection at a time.

"Multi-Project Compilation CDs" on Page 331 discusses the various ways in which you can assemble an audio CD from multiple projects.

Positioning Mastered Selections

After mastering the first selection, master the next selection, and so on, placing each new selection behind the previous one on the mastering tracks. The resulting mastering tracks contain a string of phrases, with each phrase playing the audio for one of the selections. You can edit these phrases later to refine their spacing, trim unwanted audio or change the selections' order (Page 336).

The Mastering Room's After Rec parameter places each new selection. Its values are:



- *to ZERO*—records the new mastered audio at Time 00h00m00s00f00, the beginning of the CD. Use this setting when you're creating a single-selection CD, or when you're recording the first selection in a multi-selection CD.
- *to Last Phrs:0s*—places the new mastered audio at the end of the audio already recorded on the mastering tracks, with no space between them.
- *to Last Phrs:2s*—places the new mastered audio at the end of the audio already recorded on the mastering tracks, with a two-second space between them.
- *to Last Phrs:4s*—places the new mastered audio at the end of the audio already recorded on the mastering tracks, with a four-second space between them.
- Stay HERE—records the new mastered audio in the same location in the project as its source data. Use this setting if you've created a compilation project, have moved its selections so that they play one after another, and are mastering each selection individually in order to be able to individually concentrate on each selection's mix.

Placing Markers Automatically

When you add a new selection to already mastered audio, the Mastering Room's Auto Marker feature can place a CD track marker at the new selection's beginning to save you time later on. (The CD marker at the very start of the mastering tracks is added automatically during CD burning.) To turn on this feature, set Auto Marker to On.

Auto Marker places a CD track marker only at the beginning of a new selection—it doesn't place markers after pauses in the audio within the selection.

Use Auto Marker only if you're sure your mastering tracks will require no editing after they've been recorded—otherwise, you'll have to delete and re-place the CD track markers after moving your audio.

To make your CD track markers line up numerically with your selections, place two standard markers as dummy markers in the first selection, as described on Page 338.

Using the Mastering Tool Kit

In the Mastering Room, you can insert any of the VS-2400CD's Mastering Tool Kit (MTK) effects onto the MASTER bus to add the final touch of processing to your mix.

The MTK effect patches cover a wide variety of mastering situations, and are all fully editable so that you can customize them for your particular needs. Each MTK effect is a powerful stereo effect that requires the resources of two effect processors.

You can chain together as many MTK effects as your effect processing power allows, though a single MTK effect is likely to be all you'll need. If you chain MTK effects, the MASTER bus signals flows through them one after another in numerical order, as with a single-channel insert chain (Page 210).

To insert a Mastering Tool Kit effect:

1. In the Mastering Room, select the FX Ins ("Effect Insert") parameter—the ENTER/YES button begins to flash.
2. Press F2 (FX Ins) or ENTER/YES to display the MASTER EFFECT INSERT screen. This is the same screen we described in "Inserting Effects on the MASTER Bus" on Page 213.
3. Select an available odd-numbered effect's insert assign switch. You can assign an MTK effect only to an odd-numbered effect since it also requires the processing power of the effect's even-numbered partner.
4. Set the switch to Ins to insert the effect on the MASTER bus. If you wish to return to the Mastering Room, you can press F1 (Param) or F6 (EXIT).
5. Press the flashing ENTER/YES button to display the effect's Algorithm View screen from which you can select the desired MTK effect patch or edit the effect's currently selected patch (Page 215).

Technically, you can insert any effect patch on the MASTER bus, but we recommend using one of the MTK effect patches for mastering—that's what they're designed for.

6. To return to the Mastering Room, hold down SHIFT and press CD-RW/MASTERING.

In addition to being able to edit an MTK effect as desired, you can also adjust the MASTER EFFECT INSERT screen's Send and Return parameters to adjust the level of the MASTER bus's signal going into, and coming out of, the MTK effect.

Recording Mastering Tracks

1. On the Mastering Room screen, set MASTERING ROOM to On.
2. Set STATUS to Record.
3. Set your other Mastering Room parameters as desired.
4. Press ZERO or move the now line to the beginning of the mix you want to record onto your mastering tracks.
5. Hold down REC and press PLAY.
6. When the mix has finished playing, press STOP.

7. To hear your mastering tracks, set STATUS to Play.
8. Press PLAY.
9. If you'd like to re-do the mastering tracks, Repeat Steps 2-8

Stretching Effects

If you're using all of your effects in your mix, you won't have any processing power left over for an MTK effect. Solve this dilemma by using the Mastering Room twice:

- The first time, you'll create mastering tracks of your mix with the desired effects.
- The second time, you'll process those mastering tracks using the desired MTK effect, creating final mastering tracks.

On your first visit, you'll use the Mastering Room only for its ability to mix all of your project's tracks down to a pair of mastering tracks, leaving its other tools for your second visit. Here's what you can do to stretch your effects:

1. Set up the Mastering Room for your first visit as follows:
    - Set STATUS to Record.
    - Set CD Rec Mode to off so that the mastering tracks are recorded using the project's recording mode.
    - Set Auto Marker to Off.
    - For V. Track, select any pair of Track 23 and 24's unused V-Tracks. Make sure you still have another pair left to use as your final mastering tracks.
    - Set FX Ins to Off.
    - Set After Rec to ZERO.
2. Record your mix onto the selected mastering V-Tracks.
3. Select a new pair of V-Tracks for your final mastering tracks.
4. Press Track Channel 23's CH EDIT button and press Track Channel 24's to link the two track channels.
5. Select the V-Track you used for mastering in Step 1.
6. While holding down CLEAR, press Track Channel 23's CH EDIT button to set both track channels to 0dB.
7. Return to the Mastering Room and set the Mastering Room parameters—adding the desired MTK insert effect—for the recording of your final mastering tracks. Turn off the TRACK STATUS buttons for all tracks other than Tracks 23 and 24.

Editing Mastering Tracks

You can edit mastering tracks to trim unwanted space from before and after the audio, between sections, and to remove unwanted audio or outtakes.

If you're editing CDR-recorded mastering tracks in a project that uses some other mode, turn on the Mastering Room and set it to Play to hear what you're editing.

1. Go to the CH EDIT VIEW screen for Track Channel 23.
2. Set ChLink to On to link Tracks 23 and 24.
3. Select the V-Track you used as a mastering track.
   If you've:
    - *created a single-piece mastering track*—its data appears as a single pair of phrases in the project's playlist.
    - *constructed a mastering track from individual selections one-by-one*—each selection appears as a pair of phrases in the playlist.

4. Use phrase editing to trim any extra space from the very beginning of the mastering track. During the actual burning of your audio CD, the VS-2400CD places the first CD track marker at the beginning of the mastering track—trimming its front ensures that the CD track marker lines up with the first audio you want to hear, not silence, a countoff or other unwanted sounds.

We recommend leaving about 15 frames of time before the audio actually begins so that your CD plays correctly even on slower CD players.

5. If the mastering track contains multiple selections, make sure that they're in the right order and the spaces between them are as you want them. Perform any phrase edits you need to in order to make the entire mastering track flow as desired.

Once you've completed the editing of your mastering tracks, you can move on to the final preparatory step: adding CD track markers.

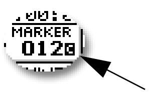
Placing CD Track Markers

"Understanding CD Track Markers" on Page 332 describes the purpose of CD track markers. This section describes the mechanics of placing them in your mastering tracks.

Though they have a very different purpose, you can work with CD track markers in much the same way you work with the VS-2400CD's project markers (Page 182).

What CD Track Markers Look Like

Once placed, CD track markers appear above the playlist as downward-pointing triangles, just like normal markers. you can identify them as CD track markers in the current time location display's Markers counter—in the counter, each CD track marker has a "C" to its right.



CD track markers appear in the Locate to Marker window along with the rest of the project's markers (Page 183). You can identify a CD track marker in this window by its location.

About CD Track Marker Numbering

Each marker in a project—including each CD track marker—is identified by its number, as described on Page 183. As you add each new marker, it assumes its place in the project's marker list, and all subsequent markers' numbers go up by one.

If your project contains no other markers, here's how they'll be numbered when you're creating an audio CD with four selections—we'll use four songs in our example:

Location:	*CD Track Marker is numbered as:*	*CD Track:*
Beginning of Song #1	none needed—placed automatically	1
Beginning of Song #2	000c	2
Beginning of Song #3	001c	3
Beginning of Song #4	002c	4

Obviously, this can be confusing—starting with the second selection, the CD track number's marker is lower than the CD track's by two. If your project contains other markers, numbering can become *really* baffling.

You'll find the process of placing CD track markers much simpler if the numbers of the CD track markers you place correspond to the numbering of the CD's audio selections. There are a couple of things you can do to make this happen.

Delete all of the project's other markers

When you do this, your marker numbering starts with a clean slate. If you don't want to lose your markers, make a second copy of the project (Page 97). Remove the markers—and burn your CD—from one of the project copies. See Page 184 to learn how to delete all of a project's markers.

Place a pair of dummy markers in the first selection

Since your CD burner ignores the VS-2400CD's normal project markers, you can place two "dummy" markers somewhere in the middle of the first selection—it doesn't matter where, as long as they're at least four seconds after the start of the selection and at least four seconds before its end. These two markers push the remaining CD track marker numbers back into line with the CD's track numbers. To use our example again:

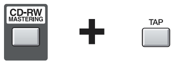
Location:	*CD Track Marker is numbered as:*	*CD Track:*
Beginning of Song #1	none needed—placed automatically	1
Middle of Song #1	(Normal Marker #000)	*(ignored by CD-R/RW)*
Middle of Song #1	(Normal Marker #001)	*(ignored by CD-R/RW)*
Beginning of Song #2	002c	2
Beginning of Song #3	003c	3
Beginning of Song #4	004c	4

Placing CD Track Markers

1. Press HOME•DISPLAY to view the Home screen.
2. Position the now line at the beginning of the second selection on your mastering tracks. (Remember, the first selection's CD track marker is set automatically).

Use the VS-2400CD's Scrub feature (Page 178) to place the now line as precisely as you can, about 15 frames before the start of the selection's audio. The placement of the CD track marker determines what happens when a listener selects the track on a CD player, so make sure you've set the CD track marker where you want it.

3. While holding down CD-RW/MASTERING, press TAP to place the CD track marker.
4. Repeat Steps 1 and 2 for any other CD track markers you want to place in your mastering tracks.

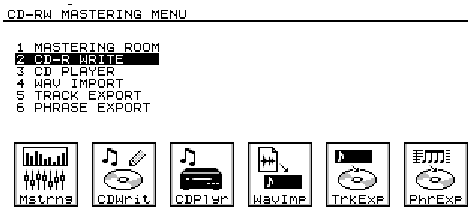


When you're done, you can jump from marker to marker to check their positions using the PREVIOUS and NEXT buttons—see "Using PREVIOUS and NEXT" on Page 183. If you need to clear and re-place a CD track marker, use PREVIOUS or NEXT to move the now line to the marker, hold down CLEAR and press TAP.

CD-R/RW Operations

All CD-R/RW operations described in the following sections start on the CD-RW MASTERING MENU screen. To get there:

1. Press CD-RW—the CD-RW MASTERING MENU screen appears.



One of the most important CD-R/RW operations is the PROJECT menu's BACKUP operation, described in Chapter 7, on Page 101.

If you encounter error messages while using your CD-R/RW drive, see Page 343 or the *VS-2400CD Appendices* for explanations of the VS-2400CD's error messages.

Creating an Audio CD

Track at Once or Disk at Once?

The VS-2400CD allows you to select the way you want to write an audio CD:

- *adding tracks to a CD one at a time*—This can be a great way to compile a CD of work mixes to listen to. As you create each new mix, burn it onto your work CD. This method of creating a CD is called "Track at Once" or "TAO" for short. You can create Track at Once CDs only with CD-R disks.
- *writing all of the tracks in a single CD-burning process*—When you've created mastering tracks that contain all of a CD's selections positioned as you want them, you can burn the entire "Disk at Once," as this method's called, or "DAO" for short.

If you plan to mass-duplicate your CD when it's done, check with the duplication service you're going to use—some duplicators accept only DAO-created CDs.

Finalizing

Before a CD can be played on an ordinary CD player, certain important information must be written onto the CD, including track numbers and a Table of Contents, or "TOC." This last step in the CD-creation process is called "finalizing." Until then, the CD can be played only on your VS-2400CD or another Roland V-Studio with a CD-R/RW drive—see "The CD Player Feature" on Page 343.

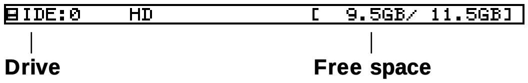
Once a CD-R's been finalized, no more audio can be added to it—you can erase a CD-RW and start over. You can finalize a CD during the CD creation process. To finalize a CD without adding audio, use the procedure on Page 339, setting Finalize to OnlyFin.

Making Sure You Have Enough Space

Before burning an audio CD, you'll want to make sure your audio is going to fit on the blank CD-R or CD-RW. In addition, if your mastering tracks were created using any recording mode other than CDR mode, the VS-2400CD will need the same amount of free space on your hard drive to create the necessary disk image file (Page 330) during the CD-burning process.

Before starting the CD-burning process, figure out how much free space is available on your internal hard drive:

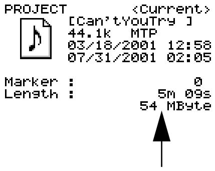
1. Press PROJECT—the VS-2400CD scans your connected drives and displays information about each drive.
   The VS-2400CD can use any free space on your internal hard drive for the creation of a disk image, not just the currently selected drive, or partition.
2. Add up all of the free space left on your IDE drives. This is the amount of free space you have available.



```
IDE:0    HD            [  9.5GB/ 11.5GB]
```

Once you've started burning the CD, the CD-R WRITE screen provides the information you need to calculate the amount of room you need:

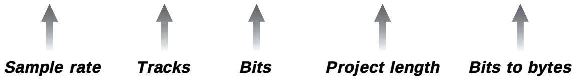
1. On the CD-R WRITE screens, locate the length of your project in minutes and seconds.
2. Multiply the minutes by 60, and add the result to the seconds to arrive at the length of the project in seconds.
3. Apply the following formula:



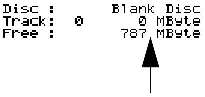
```
PROJECT          <Current>
       [Can'tYouTry ]
       44.1k  MTP
       03/18/2001 12:58
       07/31/2001 02:05

Marker :               0
Length :          5m 09s
                54 MByte
```

44,100 x 2 x 16 x seconds x 1/8



The result is roughly the amount of space you'll need on the CD and on your internal hard drive. Compare this to the amount of free space on the CD as shown in the lower right corner of the CD-R WRITE screen, and to the amount of free hard drive space you have available.



```
Disc :       Blank Disc
Track:  0       0 MByte
Free :        787 MByte
```

Burning an Audio CD

The following describes how to burn mastering tracks onto an audio CD. In fact, you can burn any two tracks onto an audio CD, as long as they use a 44.1kHz sample rate.

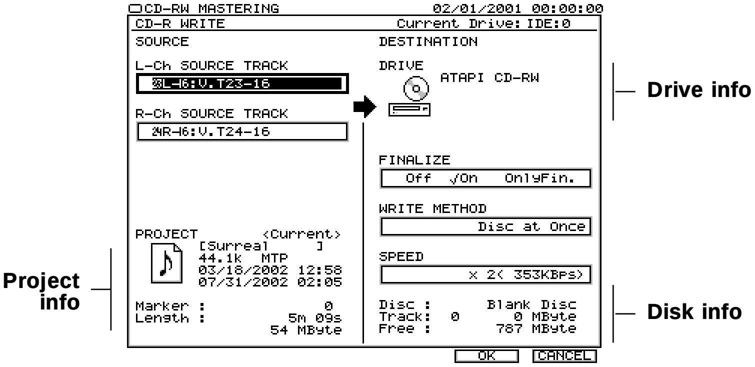
You can create an audio CD using either CD-R or CD-RW disks. Note, however, that not all CD players can play CD-RW disks, nor will all mass-duplicators accept them. We recommend using CD-R disks only when you're creating final CDs for other people or for mass duplication.

If your mastering tracks were created in a recording mode other than CDR, press PROJECT and add up the remaining free space on your IDE drives as described above before proceeding—you'll need to know this information as you burn your CD.

1. Insert a blank CD-R or CD-RW disk into your CD-RW drive.
2. Press CD-RW/MASTERING.

F2 (CDWrit)

3. Press F2 (CDWrit)—”Store Current?” appears on the display.
4. Press ENTER/YES to store the most recent changes to your project—including any mastering tracks you’ve just created—or press EXIT/NO to proceed without re-saving your project.
   After your press the desired button, the VS-2400CD performs a few setup operations—this takes a few moments. When the VS-2400CD has finished setting itself up for CD burning, the CD-R WRITE screen appears.



```
CD-RW MASTERING                    02/01/2001 00:00:00
CD-R WRITE                     Current Drive: IDE:0
SOURCE                        DESTINATION
L-Ch SOURCE TRACK             DRIVE
 23L-16:V.T23-16                      ATAPI CD-RW
R-Ch SOURCE TRACK
 24R-16:V.T24-16
                              FINALIZE
                                 Off  √On   OnlyFin.
                              WRITE METHOD
PROJECT          <Current>                Disc at Once
       [Surreal      ]        SPEED
       44.1k  MTP                        x 2( 353KBps)
       03/18/2002 12:58
       07/31/2002 02:05
Marker :                0     Disc :      Blank Disc
Length :           5m 09s     Track:  0       0 MByte
                 54 MByte     Free :        787 MByte
                                        OK    CANCEL
```

If you’ve got a CD-RW disc in your burner, the VS-2400CD displays a reminder that that many CD players can’t play an audio CD-RW:

CD-RW (ReWritable)!!
Can’t be Played back
with Audio CD Player.
Are You Sure?

5. Press ENTER/YES to proceed, or EXIT/NO to cancel the operation.
6. If you’re re-using a CD-RW disk that you want to erase, see Page 342.
7. Make sure you have enough room on the CD for your audio, calculating the space you’ll need as described in “Making Sure You Have Enough Space” on Page 340.
8. If your mastering tracks were recorded using a recording mode other than CDR, verify that you have enough free space on your internal hard drive to create a disk image file—again, see Page 340.

If you lack the required space on the CD—or on your hard drive, as in Step 8—press F6 (CANCEL). If the CD is blank and still won’t hold your audio, you’ll need to trim the audio so that it fits. If the CD has other selections on it already, consider starting a new CD. If you need to make a disk image and don’t have enough room on your hard drive, you’ll need to clear some space on the drive before proceeding.

9. Select the mastering tracks—or other pair of tracks—you want to burn on the CD. You can select these in either of two ways. To select your tracks:
   - *at the same time*—select the L-Ch SOURCE TRACK parameter and turn the Time/Value dial to select the same-numbered V-Tracks on any odd/even pair of project tracks.
   - *individually*—select a pair of V-Tracks using the L-Ch SOURCE TRACK parameter, and then use the R-Ch SOURCE TRACK parameter to select a different right-side V-Track.

You can easily spot a V-Track recorded in CDR mode—it has an asterisk in its number instead of a hyphen.

CDR-recorded V-Tracks

17L*16:V.T17-16
18R*16:V.T18-16

Standard V-Tracks

17L-16:V.T17-16
18R-16:V.T18-16

10. Select the desired WRITING METHOD: Track at Once or Disk at Once (see Page 339).

If you select Track at Once, make sure to use a CD-R disk. You can't write a Track at Once CD-RW disk.

11. Set Finalize (Page 339) as desired. You can set it to:
    - *Off*—Use this setting when you're burning audio on a Track at Once CD, and you'll to be adding more audio later.
    - *On*—Use this setting when you're burning a Disk at Once CD, or when you're adding the last selection to a Track at Once CD.
    - *OnlyFin. ("Only Finalize")*—Use this setting when you've decided you're done adding selections to a TAO CD, but haven't yet finalized the CD.
12. Select the speed at which the burner is to write the CD. You can select any of the available speeds—you'll only be offered choices supported by your burner.

Try using the highest available speed to make the burning operation as brief as possible. If you have trouble burning the CD, try a lower speed.

13. Press F5 (OK) to begin burning the CD.
    The VS-2400CD asks if you're sure you want to burn the disk with your current settings, and if you've remembered to place the CD's track markers:

Audio CD-R Write Sure?
(selected writing method)
CD Track No. OK?

14. If you wish to proceed, press ENTER/YES. To cancel the operation, press EXIT/NO.
15. The VS-2400CD displays a message about copyrighted material. When you've read the message, press ENTER/YES, or press EXIT/NO to cancel the operation.
16. A screen appears that discusses licensing terms. If you agree to these terms, press ENTER/YES to proceed. Otherwise, press EXIT/NO to cancel the operation.
    If you press ENTER/YES, the VS-2400CD proceeds to burn the CD.
    When it's finished, the VS-2400CD asks if you'd like to burn another CD of the same audio material. If you do, insert a new CD in your burner and press ENTER/YES, or press EXIT/NO to complete your CD-burning session.
17. If you press EXIT/NO, the VS-2400CD displays "Done!"

Erasing a CD-RW Disk

- If you attempt to write to a CD-RW that already contains data, the VS-2400CD displays:

Finalized Disc! or *Not Blank CD!*

- Press ENTER/YES to proceed. The VS-2400CD then displays:

CD-RW (ReWritable)!!
Erase?
All Data on the CD-RW
will be Erased.
Are You Sure?

- Press ENTER/YES to erase the current contents of the CD-RW disk. The erasing procedure takes a few moments.
- Once the disk's been erased, the VS-2400CD shows the same message as in Step 5 on Page 341. Press ENTER/YES to proceed or EXIT/NO to cancel.
- Finally, the VS-2400CD asks if you're sure you want to proceed, as in Step 13 above. Press ENTER/YES to proceed, or EXIT/NO to cancel the operation.

If You Encounter Error Messages During CD Burning

The two error messages you're most likely to see during CD burning are the following:

- *Please Insert CD-R Disc!*—If you see this message, there's no CD-R or CD-RW disk in the burner, the burner's tray isn't closed, or the burner's not ready for use.
- *Not 44.1kHz Project!*—If you see this, the tracks you're trying to burn to the CD are not recorded at the required 44.1kHz sample rate.

The *VS-2400CD Appendices* contain explanations of additional error messages.

The CD Player Feature

You can use your CD-R/RW drive as a CD player that can play CDs that haven't yet been finalized. It can also play any finalized CD, as well as commercial CD releases.

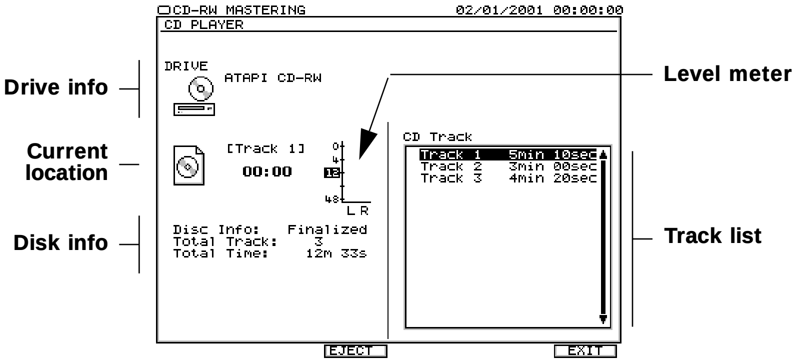
When you're using the CD Player feature, you can listen through the VS-2400CD's MASTER and MONITOR outputs, as well as the PHONES jacks. The CD Player feature is for listening only—you can't route audio from the CD to tracks for recording, or to additional VS-2400CD output jacks or connectors.

When you're listening to a CD that hasn't yet been finalized, you won't be able to hear approximately the final .5 seconds of each track.

Playing an Audio CD

1. Press CD-RW/MASTERING.
2. Press F3 (CDPlyr)—the CD PLAYER screen appears.

F3 (CDPlyr)



02/01/2001 00:00:00

ATAPI CD-RW

[Track 1] 00:00

Disc Info: Finalized
Total Track: 3
Total Time: 12m 33s

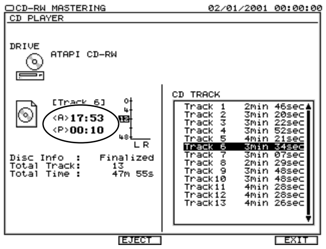
Track 1 5min 10sec
Track 2 3min 00sec
Track 3 4min 20sec

3. Insert the desired CD into the drive.

To:	*Press:*
Play the CD from your current location	PLAY
Halt playback at the current position	STOP
Rewind to the top of the CD	ZERO
Jump to the start of the next track	NEXT
Jump to the beginning of the previous track	PREVIOUS
Eject the CD	F3 (EJECT)
Turn off the CD Player feature	F6 (EXIT)

When the CD's not playing, you can use the VS-2400CD's REW or FF buttons to change your current location on the CD.

About the CD Player Time Display



[Track 6]
<A>17:53
<P>00:10

Disc Info : Finalized
Total Track: 13
Total Time : 47m 55s

Track 1	2min 46sec
Track 2	3min 20sec
Track 3	3min 22sec
Track 4	3min 52sec
Track 5	4min 21sec
Track 6	3min 34sec
Track 7	3min 07sec
Track 8	2min 29sec
Track 9	3min 48sec
Track10	3min 48sec
Track11	4min 28sec
Track12	4min 28sec
Track13	4min 26sec

To help you locate audio for CD Capture (Page 348), the CD Player shows the current playback time in two ways:

- *<A> ("Absolute" time)*—shows the amount of time since the start of the CD.
- *<P> ("Program" time)*—shows the time since the start of the current track.

.WAV File Importing

The VS-2400CD's WAV Import feature allows you to load linear-format (PCM) .WAV audio files from a data CD. There are many recordings and samples that use Microsoft's .WAV format available on commercial CDs and on the Internet. When you import a .WAV file, you can place it on any track in the current project.

Both Windows and MacOS computers can read .WAV files.

Converting .WAV Files

The VS-2400CD converts .WAV files to the current project's recording mode when it imports them. When a .WAV file is at the same sample rate as the project, this conversion can be quite quick. On the other hand, if it's not, the conversion can take a while. You can choose to perform a Normal conversion—for the best audio quality—or a Quick conversion if you're in a hurry.

If the .WAV file is at a different sample rate than the project, the file's sound may change when it's imported into the VS-2400CD.

ISO 9660 CDs

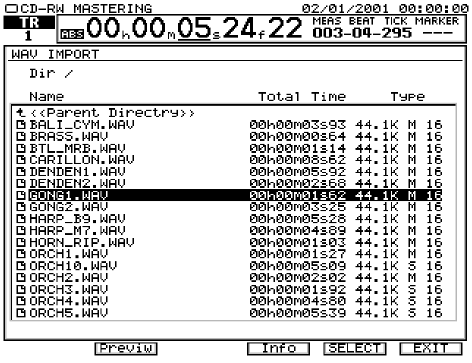
The WAVE Import feature recognizes only ISO 9660-format CDs. If you're preparing a data CD of .WAV files on a computer, make sure the CD uses the ISO 9660 format. Both PCs and Mac can create CDs in this format with the proper CD-burning software.

The WAV IMPORT Screen

All WAV Import operations take place on the WAV IMPORT screen:

F4 (WavImp)

1. Insert the CD containing the .WAV files into your CD-R/RW drive.
2. Press CD-RW/MASTERING.
3. Press F4 (WaveImp)—the WAV IMPORT screen appears.



Dir /

Name	Total Time	Type
<<Parent Directry>>		
BALI_CYM.WAV	00h00m03s93	44.1K M 16
BRASS.WAV	00h00m00s64	44.1K M 16
BTL_MRB.WAV	00h00m01s14	44.1K M 16
CARILLON.WAV	00h00m08s62	44.1K M 16
DENDEN1.WAV	00h00m05s92	44.1K M 16
DENDEN2.WAV	00h00m02s68	44.1K M 16
GONG1.WAV	00h00m01s62	44.1K M 16
GONG2.WAV	00h00m03s25	44.1K M 16
HARP_B9.WAV	00h00m05s28	44.1K M 16
HARP_M7.WAV	00h00m04s89	44.1K M 16
HORN_RIP.WAV	00h00m01s03	44.1K M 16
ORCH1.WAV	00h00m01s27	44.1K M 16
ORCH10.WAV	00h00m05s09	44.1K S 16
ORCH2.WAV	00h00m02s02	44.1K M 16
ORCH3.WAV	00h00m01s92	44.1K S 16
ORCH4.WAV	00h00m04s80	44.1K S 16
ORCH5.WAV	00h00m05s39	44.1K S 16

This screen presents you a list of all of the .WAV files and folders in the CD's currently selected directory. You can select any item in the list by using ▼ and ▲ or the Time/Value dial to highlight it.

Each file directory on the CD appears in the displayed list as a folder. To open a folder, select it and press F5 (ChgDir) for "Change Directory." When you're inside a folder, an upward arrow points you back to the folder's parent directory. To move up and back out of the folder, highlight "<<Parent Directry>>" and press F5 (ChgDir) again.

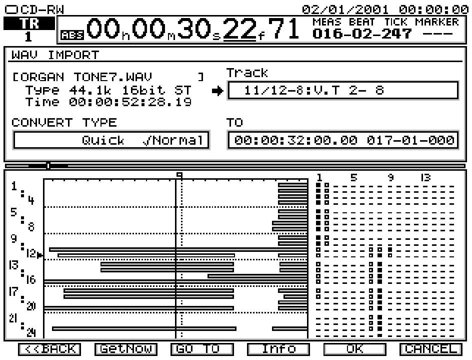
The list provides information about each of its .WAV files. The Type column shows the file's sample rate, whether it's mono or stereo, and its bit depth. Press F4 (Info) to toggle the contents of the middle column on the display. This column can show you each file's:

- *Size*—in hours, minutes, seconds and frames.
- *Last Update*—the date on which the file was last modified.

To hear a preview of a .WAV file, select it and press F2 (Previw) for "Preview."

Importing a .WAV File

1. Insert a CD containing .WAV files into your CD-R/RW drive.
2. Press CD-RW/MASTERING.
3. Press F4 (WaveImp).
4. Highlight the .WAV file you want to import.
5. Press F5 (SELECT)—the WAV Import Destination screen appears.



CD-RW 02/01/2001 00:00:00

TR 1 ABS 00h00m30s22f71 MEAS BEAT TICK MARKER 016-02-247 ---

WAV IMPORT

[ORGAN TONE7.WAV]
Type 44.1k 16bit ST
Time 00:00:52:28.19

Track: 11/12-8:V.T 2- 8

CONVERT TYPE: Quick √Normal

TO: 00:00:32:00.00 017-01-000

As on the WAV IMPORT screen, you can press F4 (Info) to toggle the display of the selected file's size or its last modification date.

To return to the WAV IMPORT screen, press F1 <<BACK). To abort the procedure, press F6 (CANCEL).

6. To select a destination V-Track, or V-Tracks if you're importing a stereo .WAV file:
   - select the TRACK parameter and turn the Time/Value dial to select any desired destination V-Track for the imported audio.
   - press the desired destination track's flashing TRACK STATUS button to select its currently selected V-Track—the TRACK STATUS button lights solidly.

If you're importing a stereo .WAV file, when you select a destination V-Track, you select a pair of V-Tracks on odd/even tracks.

You can import the .WAV file to any time location in the project—TO sets the location at which the beginning of the imported audio is placed. You can move the now line to the current TO location by pressing F3 (GO TO).

7. Set TO by:
   - *entering it manually*—Use the cursor buttons and the Time/Value dial to manually enter the desired TO location.
   - *moving the now line*—Cursor up to the current time location display and move the now line to the desired location in the project. Once there, press F2 (GetNow) to enter the now line's current location as the TO point.

There's nothing to prevent you from importing a .WAV file onto a track—and at a time location—where there's already data. Be sure to select your destination V-Tracks and time location carefully—the imported data will replace whatever's there.

8. Select the desired type of file conversion, as described in "Converting .WAV Files" on Page 344.
9. Press F5 (OK) to import the .WAV file to the selected V-Track and time location.
10. When the VS-2400CD displays "Done!" press F1 (<<BACK) to return to the WAV IMPORT screen.
11. Press F6 (EXIT) to leave the WAV IMPORT screen and listen to the imported audio.

Exporting Tracks and Phrases as .WAV Files

If you want to move audio from a project to an external device—such as a computer or sampler—that reads .WAV files, you can export any track or phrase as a .WAV file. The exported audio is written onto a data CD.

Since most audio programs can read .WAV files, you can process exported VS-2400CD audio using virtually any audio processing or editing software. Afterwards—and after saving the result as a .WAV file—you can re-import the audio back into the VS-2400CD.

When you want to export an entire track, use the Track Export feature. To export portions of a track, use the VS-2400CD's phrase editing tools to fashion the audio into a phrase, and use the Phrase Export feature.

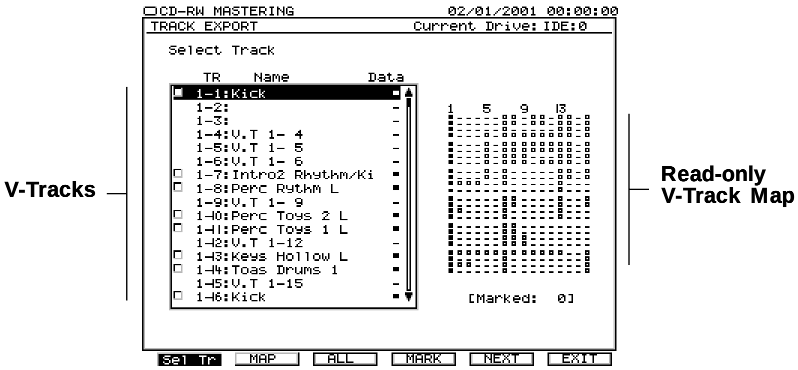
The VS-2400CD exports each pair of linked tracks as a stereo .WAV file.

The procedures for exporting tracks and phrase start a bit differently, but end on the the same CD-burning screen.

Exporting Tracks as .WAV Files

1. Insert a blank CD-R or CD/RW into your CD burner.
2. On the CD-RW MASTERING MENU screen (Page 339), press F5 (TrkExp) for "Track Export"—the TRACK EXPORT Select Track screen appears.

F5 (TrkExp)



```
□CD-RW MASTERING                02/01/2001 00:00:00
TRACK EXPORT                Current Drive: IDE:0
  Select Track
     TR    Name              Data
■  1-1:Kick                   ■
   1-2:                       -
   1-3:                       -
   1-4:V.T 1- 4               -
   1-5:V.T 1- 5               -
   1-6:V.T 1- 6               -
□  1-7:Intro2 Rhythm/Ki       ■
□  1-8:Perc Rythm L           ■
   1-9:V.T 1- 9               -
□  1-10:Perc Toys 2 L         ■
□  1-11:Perc Toys 1 L         ■
   1-12:V.T 1-12              -
□  1-13:Keys Hollow L         ■
□  1-14:Toas Drums 1          ■
   1-15:V.T 1-15              -
□  1-16:Kick                  ■
                                    1   5   9   13
                                       [Marked:  0]
Sel Tr   MAP   ALL   MARK   NEXT   EXIT
```

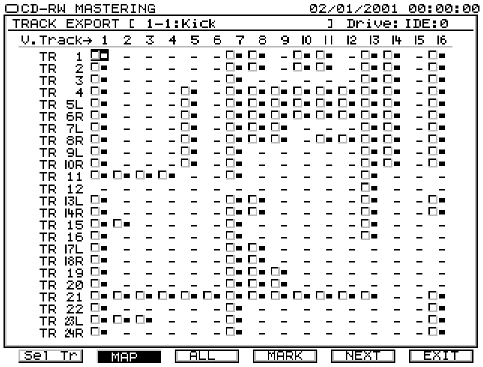
On this screen, you see a list of all of the project's V-Tracks. To the right is a V-Track map that shows you which V-Tracks contain data. When you export a track as a .WAV file, you're really exporting a V-Track—see Chapter 6 for an explanation of the relationship between tracks and V-Tracks.

You can select the V-Tracks you want to export on TRACK EXPORT's Select Track screen or on its V-Track Map screen, described on the next page. You can mark as many V-Tracks for export as you want on either screen.

3. To select a V-Track for export on the Select Track screen, turn the Time/Value dial to highlight the V-Track and press F4 (MARK) to place a checkmark next it. You can toggle on or off the selection status of all V-Tracks that contain data by pressing F3 (ALL)—this can be handy if you want to export all of your tracks as .WAV files.

Turning the Time/Value dial takes you through each of the project's V-Tracks. Hold down SHIFT as you turn to jump between same-numbered V-Tracks on different tracks.

4. To select a V-Track on the V-Track Map screen, press F2 (MAP)—the TRACK EXPORT V-Track Map screen appears.


CD-RW MASTERING
02/01/2001 00:00:00
TRACK EXPORT [1-1:Kick] Drive: IDE:0
V.Track→ 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
TR 1
TR 2
TR 3
TR 4
TR 5L
TR 6R
TR 7L
TR 8R
TR 9L
TR 10R
TR 11
TR 12
TR 13L
TR 14R
TR 15
TR 16
TR 17L
TR 18R
TR 19
TR 20
TR 21
TR 22
TR 23L
TR 24R
Sel Tr
MAP
ALL
MARK
NEXT
EXIT

Each V-Track with audio appears as a small black square with a checkbox to its left.

5. To select a V-Track for export, cursor to the V-Track and press F4 (MARK) to check its checkbox. As on the Select Track screen, you can select and unselect all of the V-Tracks at once by pressing F3 (ALL).

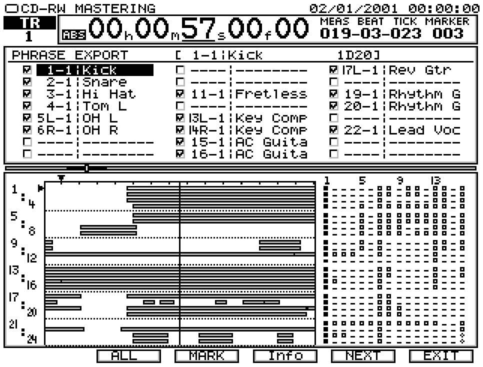
To quickly select or unselect all of a track's V-Tracks, cursor all the way to the left so that the track's name is highlighted and press F4 (MARK).

6. When you've selected all of the V-Tracks you want to export, press F5 (NEXT) to go to the WAV Export CD burning screen, described on Page 348.

Exporting Phrases as .WAV Files

1. Insert a blank CD-R or CD/RW into your CD burner.
2. On the CD-RW MASTERING MENU screen (Page 339), press F6 (PhrExp) for "Phrase Export"—the PHRASE EXPORT screen appears.

F6 (PhrExp)


CD-RW MASTERING
02/01/2001 00:00:00
TR 1
ABS 00h00m57s00f00
MEAS BEAT TICK MARKER
019-03-023 003
PHRASE EXPORT [1-1¦Kick 1D20]
1 5 9 13
ALL
MARK
Info
NEXT
EXIT

☑ 1-1¦Kick
☑ 2-1¦Snare
☑ 3-1¦Hi Hat
☑ 4-1¦Tom L
☑ 5L-1¦OH L
☑ 6R-1¦OH R
☐ ----¦---------
☐ ----¦---------
☐ ----¦---------
☐ ----¦---------
☑ 11-1¦Fretless
☐ ----¦---------
☑ 13L-1¦Key Comp
☑ 14R-1¦Key Comp
☑ 15-1¦AC Guita
☑ 16-1¦AC Guita
☑ 17L-1¦Rev Gtr
☐ ----¦---------
☑ 19-1¦Rhythm G
☑ 20-1¦Rhythm G
☐ ----¦---------
☑ 22-1¦Lead Voc
☐ ----¦---------
☐ ----¦---------

Phrase-selection area

Playlist

On this screen, you can select the phrases you want to export as .WAV files. Every phrase that's currently touching the now line appears at the top of the screen in the phrase-selection area. If a phrase you want to export isn't available for selection, turn the Time/Value dial so that the now line touches the phrase.

Repeatedly press F4 (INFO) to display any of three types of information about the displayed phrases: their names, dates of creation, and sizes.

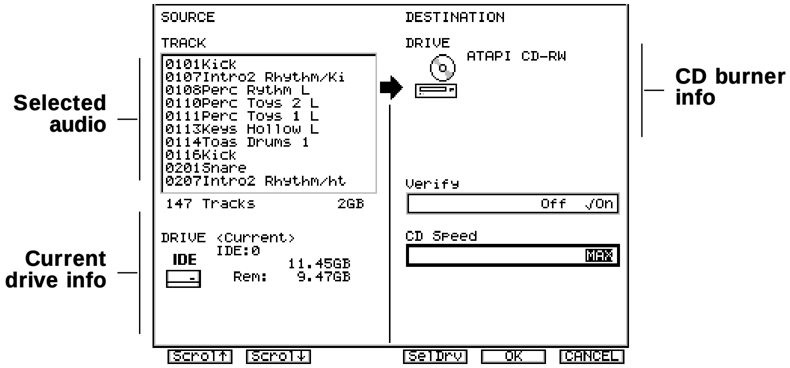
3. Select a phrase for export by cursoring to it using ▲ and ▼ and pressing F3 (MARK) to checkmark it.

You can repeatedly press F2 (ALL) to select or unselect all of the currently available phrases at once.

4. When you've selected all of the phrases you want to export as .WAV files, press F5 (NEXT) to view the WAV Export CD burning screen, described below.

Burning Exported .WAV Files to CD

1. When you've pressed F5 (NEXT) on a TRACK EXPORT or PHRASE EXPORT screen, the WAV Export CD burning screen appears. This screen is identical for exporting tracks and phrases, except for its displayed title.



```
SOURCE                          DESTINATION
TRACK                           DRIVE
0101Kick                              ATAPI CD-RW
0107Intro2 Rhythm/Ki
0108Perc Rythm L
0110Perc Toys 2 L
0111Perc Toys 1 L
0113Keys Hollow L
0114Toas Drums 1
0116Kick
0201Snare
0207Intro2 Rhythm/ht            Verify
147 Tracks          2GB                     Off  √On
DRIVE <Current>                 CD Speed
 IDE    IDE:0                                        MAX
              11.45GB
         Rem:  9.47GB
```

You can see the title of the screen and the currently selected hard drive above the area shown in this illustration.

2. A list of the selected tracks or phrases is displayed at the left of the screen—you can scroll up or down through this list to see what you're exporting by pressing F1 (Scrol↑) or F2 (Scrol↓).
3. Set Verify as desired. You can set it to:
   - *Off*—to finish the CD-burning process faster.
   - *On*—to make sure the CD has no data errors.
4. Select the desired drive speed. We recommend trying the MAX setting that uses your burner's fastest speed. If you have any trouble burning the CD, try again with a lower speed.
5. When you've returned to the screen shown above, press F5 (OK) to export your tracks or phrases as .WAV files to the CD. The process may take a little while, depending on the amount of audio data you're exporting.

CD Capture

F1 (CDCapt)

The VS-2400CD can capture audio directly from an audio CD into a project that has a sample rate of 44.1kHz, the same sample rate as audio CDs. You can capture an entire audio selection from a CD or a portion of a selection.

The CD Capture feature requires a CD-RW drive. VS-2400CDCD owners have a drive built-in. For the VS-2400CD, an optional Roland-approved CD-RW drive is required.

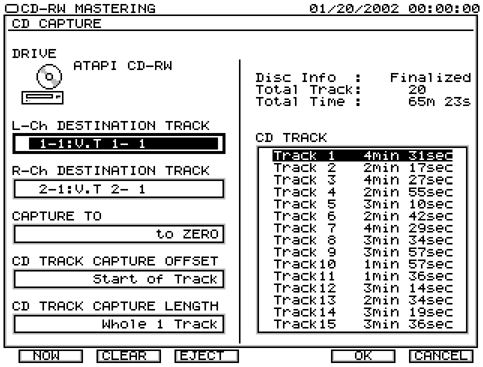
How Long a CD Capture Takes

The amount of time it takes for the VS-2400CD to capture CD audio depends on the project recording mode:

If the project's recording mode is:	*CD Capture takes:*
CDR	Approximately 40% of the CD track's playing time
M16, M24	Approximately 80% of the CD track's playing time
All other modes	Approximately 150% of the CD track's playing time

To Capture Audio from an Audio CD

1. Create or load a 44.1kHz project.
2. Insert the desired CD into your CD burner.
3. On the CD-RW MASTERING MENU screen (Page 339), press PAGE until "CDCapt" appears above F1.
4. Press F1 (CDCapt).
   The CD CAPTURE screen appears, and the VS-2400CD scans the audio CD. When it's finished, the CD TRACK list shows all of the stereo CD tracks on the CD.



DRIVE: ATAPI CD-RW

Disc Info : Finalized
Total Track: 20
Total Time : 65m 23s

L-Ch DESTINATION TRACK: 1-1:V.T 1- 1

R-Ch DESTINATION TRACK: 2-1:V.T 2- 1

CAPTURE TO: to ZERO

CD TRACK CAPTURE OFFSET: Start of Track

CD TRACK CAPTURE LENGTH: Whole 1 Track

CD TRACK

```
Track 1   4min 31sec
Track 2   2min 17sec
Track 3   4min 27sec
Track 4   2min 55sec
Track 5   3min 10sec
Track 6   2min 42sec
Track 7   4min 29sec
Track 8   3min 34sec
Track 9   3min 57sec
Track10   1min 57sec
Track11   1min 36sec
Track12   3min 14sec
Track13   2min 34sec
Track14   3min 19sec
Track15   3min 36sec
```

This CD TRACK list shows all of the tracks on the CD. You can scroll up or down through the list to view any CD tracks that aren't currently visible.

To eject the CD in the drive, press F3 (EJECT).

5. In the CD TRACK list, press the PREVIOUS or NEXT button or ▼ and ▲ to highlight the CD track you want to capture. Press the PLAY button to audition the selected track if you wish.

To reset the following parameters to their default values, press F2 (CLEAR).

6. Set L-Ch DESTINATION TRACK to select the project track and V-Track on which you want to capture the stereo CD track's left side. As a convenience, the VS-2400CD automatically selects the same V-Track on the next-highest track as the destination for its right side.

If you want to burn a new audio CD from the captured audio, select a matching pair of empty V-Tracks on Tracks 23 and 24 as your destination—the VS-2400CD can capture the audio directly into CDR mode as described on the next page. If your project uses the M16 or M24 recording mode, select matching V-Tracks on Tracks 15 and 16.

7. If you'd like to select a different right-side destination, set R-Ch DESTINATION TRACK as desired.

If the destination selected in Step 5 already contains CDR-recorded audio, this parameter cannot be manually set.

If your project uses the CDR recording mode, select matching, empty destination V-Tracks. Failure to do so will result in an "Illegal Track Pair!" error message when you attempt to execute the capture.

8. The CAPTURE TO parameter allows you to place the captured audio at the desired time location on the destination V-Tracks. You can place the captured audio:
    - *to Zero*—at project time location 00h00m00s00f.
    - *to Last Phrs:0S*—at the end of the last phrase on the destination V-Tracks.
    - *to Last Phrs:2S*—two seconds after the last phrase on the destination V-Tracks.
    - *to Last Phrs:4S*—four seconds after the last phrase on the destination V-Tracks.
9. Set CD TRACK CAPTURE OFFSET to the time at which you want to begin capturing audio from the selected CD track. If you want to start at the beginning of the CD track, select Start of Track. Otherwise, dial in the distance from the start of the track at which you want the capture to begin.

You can use the VS-2400CD CD Player's time display to identify the time location of any audio you want to grab. See Page 344.

You can set the CD TRACK CAPTURE OFFSET on the fly as you listen to the selected CD track. Press PLAY to begin playback, and press F1 (NOW) when you reach the moment at which you want to start the capture.

10. The CD TRACK CAPTURE LENGTH parameter sets the amount of audio to be captured from the CD track after the selected CD TRACK CAPTURE OFFSET time. To capture the remainder of the CD track's audio, set the parameter to Whole 1 Track. Otherwise, set it as desired.
11. Press F5 (OK).
12. Read the displayed message regarding copyright, and then press ENTER/YES to proceed.
    If you selected empty matching V-Tracks on Tracks 23 and 24 in Steps 7 and 8—or on Tracks 15 and 16 in an M16 or M24 project—the VS-2400CD can capture the CD audio as CDR-mode mastering tracks that you can burn directly to a new audio CD. If you selected another pair of destination tracks, skip to Step 13.
13. When the VS-2400CD displays "Capture to Mastering Tr. In CDR Mode?" press ENTER/YES if you want to capture the audio in CDR mode, or EXIT/NO to capture it using the project's normal recording mode.
14. Read the displayed message about licensing, and press ENTER/YES to proceed. The capture process begins and the display shows "CD Capture..."
15. To exit CD CAPTURE, press F6 (EXIT).

To Pause or Cancel an Ongoing CD Capture Operation

You can pause or cancel a CD Capture operation while it's taking place:

1. Press EXIT/NO—"Abort?" is displayed.
2. Press ENTER/YES to cancel the operation, or EXIT/NO to resume it.

27—Utility Menu Parameters

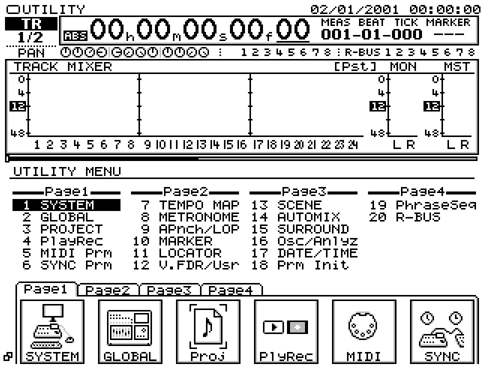
The UTILITY MENU contains a wide array of parameters. Some of its screens present parameters that set the general behavior of the VS-2400CD—or its behavior when a particular project is loaded—while others offer detailed control of specific VS-2400CD features. This chapter describes what you'll find in the UTILITY menu.

We've already explained many of the UTILITY menu's screens and parameters in earlier chapters—as we go through the UTILITY menu screens, we'll refer you to relevant descriptions elsewhere in the *VS-2400CD Owner's Manual*. They're noted here for completeness.

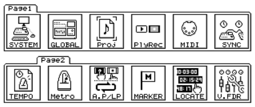
The Main UTILITY Menu Screen

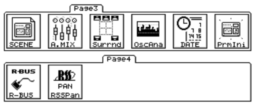
To view the UTILITY menu:

1. Hold down SHIFT and press F4•UTILITY.


UTILITY
02/01/2001 00:00:00
TR 1/2
ABS 00h00m00s00f00
MEAS BEAT TICK MARKER
001-01-000 ---
PAN
R-BUS
TRACK MIXER
[Pst] MON MST
UTILITY MENU
Page1
1 SYSTEM
2 GLOBAL
3 PROJECT
4 PlayRec
5 MIDI Prm
6 SYNC Prm
Page2
7 TEMPO MAP
8 METRONOME
9 APnch/LOP
10 MARKER
11 LOCATOR
12 V.FDR/Usr
Page3
13 SCENE
14 AUTOMIX
15 SURROUND
16 Osc/Anlyz
17 DATE/TIME
18 Prm Init
Page4
19 PhraseSeq
20 R-BUS
Page1 Page2 Page3 Page4
SYSTEM
GLOBAL
Proj
PlyRec
MIDI
SYNC

You can display any of the UTILITY menu's screens by cursoring to it in the UTILITY menu and pressing ENTER/YES, or by pressing its F button shown on one of tabbed layers as the bottom of the screen.


Page1
SYSTEM
GLOBAL
Proj
PlyRec
MIDI
SYNC
Page2
TEMPO
Metro
A.P/LP
MARKER
LOCATE
V.FDR


Page3
SCENE
A.MIX
Surrnd
OscAna
DATE
PrmIni
Page4
R-BUS
PAN
RSSPan

If you're looking for an screen whose F button is currently hidden, press PAGE repeatedly until its F button appears.

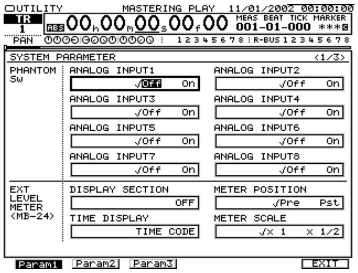
The SYSTEM, GLOBAL, PLAY/REC and V.FDR buttons each lead to sets of related screenfuls of parameters—these sub-screens are called "Param1", "Param2" and, in the case of the V.FDR screenset, "Param3." To navigate between these screens, press F1 (Param1), F2 (Param2) or F3(Param3) as desired.

Many of the other UTILITY menu items also have sub-screens of their own, as explained in their descriptions.

On some UTILITY menu screens, parameters are arranged in labeled groups. In the following descriptions, we'll organize parameters according to these groupings.

SYSTEM

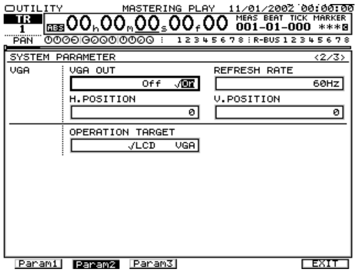
UTILITY menu
F1 (SYSTEM)


UTILITY
MASTERING PLAY 11/01/2002 00:00:00
TR 1
ABS 00h00m00s00f00
MEAS BEAT TICK MARKER
001-01-000 ***
PAN
1 2 3 4 5 6 7 8 : R-BUS 1 2 3 4 5 6 7 8
Param1
Param2
Param3
EXIT

SYSTEM PARAMETER <1/3>

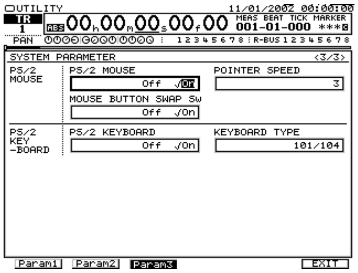
PHANTOM SW
ANALOG INPUT1: √Off On
ANALOG INPUT2: √Off On
ANALOG INPUT3: √Off On
ANALOG INPUT4: √Off On
ANALOG INPUT5: √Off On
ANALOG INPUT6: √Off On
ANALOG INPUT7: √Off On
ANALOG INPUT8: √Off On

EXT LEVEL METER (MB-24)
DISPLAY SECTION: OFF
METER POSITION: √Pre Pst
TIME DISPLAY: TIME CODE
METER SCALE: √x 1 x 1/2


UTILITY
MASTERING PLAY 11/01/2002 00:00:00
TR 1
ABS 00h00m00s00f00
MEAS BEAT TICK MARKER
001-01-000 ***
PAN
1 2 3 4 5 6 7 8 : R-BUS 1 2 3 4 5 6 7 8
Param1
Param2
Param3
EXIT

SYSTEM PARAMETER <2/3>

VGA
VGA OUT: Off √On
REFRESH RATE: 60Hz
H.POSITION: 0
V.POSITION: 0
OPERATION TARGET: √LCD VGA


UTILITY
11/01/2002 00:00:00
TR 1
ABS 00h00m00s00f00
MEAS BEAT TICK MARKER
001-01-000 ***
PAN
1 2 3 4 5 6 7 8 : R-BUS 1 2 3 4 5 6 7 8
Param1
Param2
Param3
EXIT

SYSTEM PARAMETER <3/3>

PS/2 MOUSE
PS/2 MOUSE: Off √On
POINTER SPEED: 3
MOUSE BUTTON SWAP Sw: Off √On

PS/2 KEY-BOARD
PS/2 KEYBOARD: Off √On
KEYBOARD TYPE: 101/104

PHANTOM SW

The VS-2400CD provides phantom power for its eight XLR inputs, as described on Page 126. Each input's phantom power on/off switch is available in two places, on the EZ ROUTING PATCH BAY screen—described on Page 126—and on the SYSTEM Param1 screen. Setting an input's ANALOG INPUT switch on the SYSTEM Param1 screen is the same as setting its PATCH BAY screen PHANTOM POWER on/off switch.

You can jump instantly to the PATCH BAY screen's PHANTOM POWER settings by holding down SHIFT and pressing EZ ROUTING•PHANTOM.

EXT LEVEL METER (MB-24)

Use these parameters to set the behavior of the MB-24 meter bridge (purchased separately) attached to your VS-2400CD. If you're not using an MB-24, you can ignore these parameters.

To learn how to connect an MB-24, see "Connecting an MB-24 Level Meter" on Page 375.

DISPLAY SECTION

The DISPLAY SECTION parameter selects the type of signals shown in the MB-24's 24 SECTION level meters. They can be turned off, or set to show:

Parameter Value:	*Meters show:*
ANALOG INPUT 1-8	the levels received at the VS-2400CD's analog inputs
R-BUS/COAX/OPT IN	the levels received at the R-BUS, coaxial and optical digital inputs
INPUT MIXER 1-16	input channel levels
TRACK MIXER 1-24	track channel levels
FX1-4 RETURN	effect processor output levels
AUX1-8/DIR1-8	Aux bus and Direct path levels
ANALOG OUTPUT	analog output jack levels
R-BUS/COAX/OPT OUT	R-BUS, coaxial and optical digital output levels

The "Supplemental Information" chapter provides further information regarding the MB-24. See "Roland MB-24 Notes" on Page 450.

METER POSITION

This parameter sets whether metered input, track, Aux master and FX return channel signals are shown before or after their faders on the MB-24.

TIME DISPLAY

TIME DISPLAY determines the time shown by the MB-24's time counter. It can show:

- *MEASURE/BEAT*—using the current time location display's (Page 122) measure and beats counter.
- *TIME CODE*—using the current time location display's time code counter.
- *CLOCK/SCENE*—so that the current clock time appears at the left of the counter, and the number of the currently selected scene appears at its right.

METER SCALE

When the METER SCALE parameter is set to x1 ("times 1"), displayed levels are shown in their actual scale. Set METER scale to x2 to zoom in for more precise metering.

VGA

The following parameters let you set up the VS-2400CD's output to a connected VGA monitor—we've already described them briefly on Page 64, but here's some additional detail. If you're not using an external monitor, these settings have no effect.

VGA OUT

The VGA OUT switch turns the VS-2400CD's feed to a connected monitor on or off.

REFRESH RATE

Every monitor constantly re-draws, or "refreshes," the image it displays. The faster the monitor can do this, the less likely you are to notice it doing so. When a monitor refreshes too slowly, you can see it flicker, which can wear on your eyes. You can set the parameter to 60Hz, 66Hz, 70Hz or 75Hz.

Consult your VGA monitor's documentation to learn its recommended refresh rate. If you select a value the monitor doesn't support, image quality may be poor, and damage to the monitor may result.

H.POSITION

Adjust the H.POSITION ("Horizontal Position") parameter if you'd like to shift the image on your VGA monitor to the left (negative values) or to the right (positive values). You can move as far as -5 to the left or +5 to the right.

V.POSITION

Adjust the V.POSITION parameter if you'd like to shift the image on your VGA monitor downward (negative values) or upward (positive values) by as much as -11 down or +11 up.

OPERATION TARGET

The OPERATION TARGET parameter designates either the VS-2400CD's internal LCD or a connected VGA monitor as the main operational display. The main display responds to the VS-2400CD's top-panel controls, mouse and optional keyboard. All messages also appear in the main display. When the internal LCD or external VGA monitor is not selected as the main display, it acts as the VS-2400CD's Info Display.

You can quickly toggle this parameter by holding down SHIFT and pressing MASTER EDIT•LCD⇔VGA.

The main and info displays—as well as this parameter—are described in detail in Chapter 29 starting on Page 379.

PS/2 MOUSE

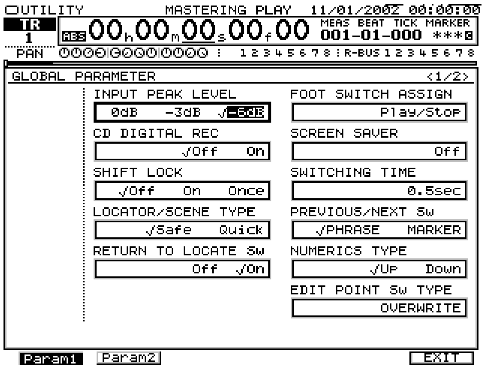
For a description of the VS-2400CD's mouse settings, see Page 64.

PS/2 KEYBOARD

For a description of the VS-2400CD's ACSII keyboard settings, see Page 64.

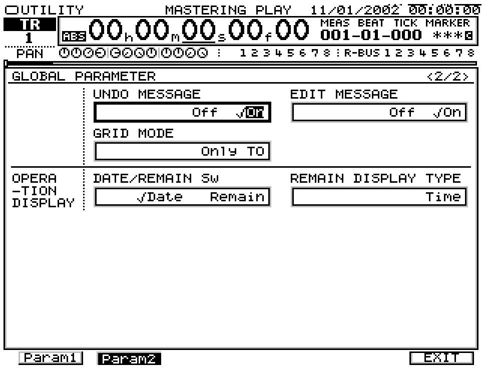
GLOBAL

UTILITY menu
F2 (GLOBAL)


UTILITY
MASTERING PLAY 11/01/2002 00:00:00
TR 1
ABS 00h 00m 00s 00f 00
MEAS BEAT TICK MARKER
001-01-000 ***
PAN
1 2 3 4 5 6 7 8 R-BUS 1 2 3 4 5 6 7 8
Param1
Param2
EXIT

GLOBAL PARAMETER <1/2>

INPUT PEAK LEVEL: 0dB -3dB √-6dB
CD DIGITAL REC: √Off On
SHIFT LOCK: √Off On Once
LOCATOR/SCENE TYPE: √Safe Quick
RETURN TO LOCATE Sw: Off √On
FOOT SWITCH ASSIGN: Play/Stop
SCREEN SAVER: Off
SWITCHING TIME: 0.5sec
PREVIOUS/NEXT Sw: √PHRASE MARKER
NUMERICS TYPE: √Up Down
EDIT POINT Sw TYPE: OVERWRITE


UTILITY
MASTERING PLAY 11/01/2002 00:00:00
TR 1
ABS 00h 00m 00s 00f 00
MEAS BEAT TICK MARKER
001-01-000 ***
PAN
1 2 3 4 5 6 7 8 R-BUS 1 2 3 4 5 6 7 8
Param1
Param2
EXIT

GLOBAL PARAMETER <2/2>

UNDO MESSAGE: Off √On
EDIT MESSAGE: Off √On
GRID MODE: Only TO

OPERA-TION DISPLAY
DATE/REMAIN Sw: √Date Remain
REMAIN DISPLAY TYPE: Time

INPUT PEAK LEVEL

The INPUT PEAK LEVEL parameter sets the level at which the input peak indicators on the Home screen and elsewhere light, as described on Page 122. You can set the input peak indicators to light when a signal coming into an input channel reaches -6dB, -3dB or 0dB—a light gray line across the input meters display (Page 120) shows the current INPUT PEAK LEVEL value.

FOOT SWITCH ASSIGN

An optional foot switch—such as a Roland DP-2 or BOSS FS-5U—connected to the VS-2400CD's rear panel FOOT SWITCH jack can perform a variety of functions. This parameter determines what a connected foot switch does. You can set the parameter to:

- *Play/Stop*—so you can start and stop project playback with the foot switch.

- *Record*—so you can toggle in and out of Record mode with each press of the foot switch, allowing for hands-free punching.
- *TapMarker*—so the foot switch acts like the TAP button: A press of the foot switch places a marker at the now line's current position.
- *Next*—so the foot switch acts like the NEXT button, moving the now line to the next phrase or marker, according to the setting of the PREVIOUS/NEXT Sw parameter (see below).
- *Previous*—so the foot switch acts like the PREVIOUS button, moving the now line to the previous phrase or marker, according to the setting of the PREVIOUS/NEXT Sw parameter (see below).
- *GPI*—so the foot switch responds to received Play/Stop instructions from a connected General Purpose Interface.

? *GPI*

CD DIGITAL REC

This switch enables or disables recording from digital audio sources such as CD players. See for "Recording Digital Input Signals" on Page 130.

SCREEN SAVER

When you've connected a color VGA monitor to your VS-2400CD, the VS-2400CD offers a built-in screen saver that turns on after a specified amount of time. The attractive, animated screen saver provides a measure of privacy by hiding the current VGA screen when you're not using it. You can set the screen saver to:

- *Off*—so it never switches on.
- *1-30min*—to specify the period of inactivity after which the screen saver automatically turns on.

SHIFT LOCK

When SHIFT is held down, many of the VS-2400CD's buttons perform their secondary function, typically—but not always—printed beneath the button in an outline box. If you're pressing the SHIFT button frequently, you can lock the SHIFT button on, or arm it for its next use. Set SHIFT LOCK to:

- *Off*—so the SHIFT button behaves normally, needing to be held down when you press the button whose behavior it changes.
- *On*—so that each press of the SHIFT button toggles it on or off. When it's on, each button you press that has a secondary function performs that function.
- *Once*—so that you can press SHIFT to arm it for its next use. Once you've pressed the next button that has a secondary function, SHIFT turns off.

SWITCHING TIME

This parameter sets the length of time a button must be held down before it performs its secondary function, allowing you to press such a button quickly when SHIFT is locked on (see above) without triggering the secondary function. You can select values between 0.3 and 2.0 sec (seconds).

PREVIOUS/NEXT SW

The PREVIOUS/NEXT Sw parameter, discussed on Page 183, sets the behavior of the PREVIOUS and NEXT buttons. You can set it to:

- *PHRASE*—so that pressing PREVIOUS or NEXT moves the now line to the previous or next edge, respectively, of a phrase.
- *MARKER*—so that pressing PREVIOUS or NEXT moves the now line to the previous or next marker, respectively.

LOCATOR/SCENE TYPE

The LOCATOR/SCENE TYPE parameters activates or de-activates the Safe mode for selecting locators and scenes, as described on Page 181 and Page 141, respectively.

NUMERICS TYPE

With NUMERICS TYPE set to:

- *Up*—numbers are entered from the numeric keypad or a keyboard from right to left, like a calculator.
- *Down*—numbers are entered from left to right.

RETURN TO LOCATE Sw

You can set the VS-2400CD so that the keypad defaults to the selection of locators—automatically exiting Scene mode after a scene is selected—as described on Page 140 and on Page 181.

EDIT POINT Sw TYPE

Edit Point Sw Type sets the behavior of the IN, OUT, FROM and TO buttons. See "Configuring the Behavior of the IN, OUT, FROM and TO Buttons" on Page 234.

UNDO MESSAGE

This parameter turns the displaying of the Undo list (Page 70) on or off. If you press UNDO when the parameter's set to:

- *Off*—the last action is reversed immediately. This setting lets you undo the most recent action in the fastest way possible.
- *On*—the Undo list appears, allowing to select the desired Undo level.

EDIT MESSAGE

When you perform various types of editing on the VS-2400CD, you can view edit messages that allow you to adjust parameters relating to the edit—see "Edit Messages" on Page 237.

You can turn this parameter on and off in the Edit and Automix Edit Pop-Up menus.

GRID MODE

The setting of the GRID MODE parameter determines how audio regions and phrases snap to their editing grid. To learn about the grid, see "Snapping to Grid" on Page 243.

OPERATION DISPLAY

DATE/REMAIN Sw

You can replace the clock in the upper right-hand corner of the VS-2400CD's LCD display with a readout of how much free space remains on the currently selected drive. When you set DATE/REMAIN Sw to:

- *Date*—the VS-2400CD's calendar/clock is displayed.
- *Remain*—the amount of free space left on the current drive is shown.

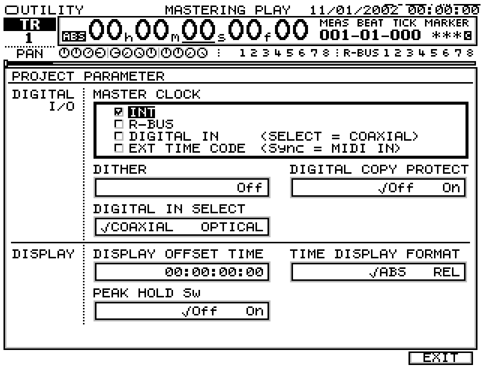
REMAIN DISPLAY TYPE

When the display is showing the remaining space on the currently selected drive—see DATE/REMAIN Sw above— REMAIN DISPLAY TYPE sets the manner in which that information's presented:

- *Time*—shows the remaining recording time based on the current sample rate and recording mode.
- *CapaMB*—shows the remaining free space in megabytes (MB).
- *Capa%*—shows the free space remaining as a percentage of the original space.
- *Event*—shows the remaining number of free project events.

PROJECT

UTILITY menu
F3 (Proj)


UTILITY
MASTERING PLAY 11/01/2002 00:00:00
TR 1
ABS 00h00m00s00f00
MEAS BEAT TICK MARKER
001-01-000 ***
PAN
1 2 3 4 5 6 7 8 R-BUS 1 2 3 4 5 6 7 8
EXIT

PROJECT PARAMETER

DIGITAL I/O

MASTER CLOCK
☑ INT
☐ R-BUS
☐ DIGITAL IN <SELECT = COAXIAL>
☐ EXT TIME CODE <Sync = MIDI IN>

DITHER: Off

DIGITAL COPY PROTECT: √Off On

DIGITAL IN SELECT: √COAXIAL OPTICAL

DISPLAY

DISPLAY OFFSET TIME: 00:00:00:00

TIME DISPLAY FORMAT: √ABS REL

PEAK HOLD Sw: √Off On

DIGITAL I/O

MASTER CLOCK

To learn about setting the MASTER CLOCK parameter, see "Designating the Master Clock for Digital Audio Input" on Page 129.

DITHER

If you're sending audio to a connected external digital recorder that records at a lower bit depth than the VS-2400CD (Page 128), you can dither the VS-2400CD's output signal so that it sounds its best at the bit depth the external device is using. Dithering adds an inaudible veil of noise to the signal in order to mask audio artifacts that are introduced when bits are discarded as audio travels from a higher bit-rate device to a lower one. To set DITHER, select the bit depth of the external digital device.

Turn off DITHER until it's needed since it affects all audio transmitted from the VS-2400CD's digital outputs, including the audio sent to your connected Roland DS-90A or DS-50A Digital Reference Monitors.

DIGITAL COPY PROTECT

The VS-2400CD allows you to use SCMS ("Serial Copy Management system") to prevent additional copies from being made of digital audio you've recorded from the VS-2400CD's coaxial or optical digital outputs onto a DAT tape or MiniDisc. To prevent copying, turn the DIGITAL COPY PROTECT parameter on before sending the digital audio to the DAT or MiniDisc recorder.

DIGITAL IN SELECT

See "Turning On the Coaxial or Optical Digital Inputs" on Page 127 for an explanation of this parameter, which also appears on the EZ ROUTING PATCH BAY screen.

DISPLAY

DISPLAY OFFSET TIME

This parameter is explained in "Shifting the Project Start Time" on Page 303.

TIME DISPLAY FORMAT

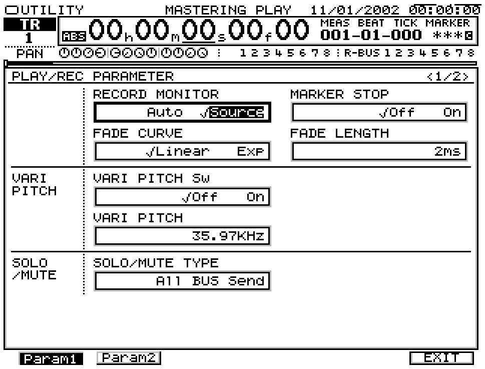
This parameter is explained in "Shifting the Project Start Time" on Page 303.

PEAK HOLD Sw

You can set the VS-2400CD's level meters so that their peak lines "stick" at their highest positions, remaining there until you press HOME•DISPLAY to release them. This allows you to look away from the display without worrying that you'll miss problematic level peaks. To make the peak lines stick, set PEAK HOLD Sw to On. To return them to their normal behavior, turn the parameter off.

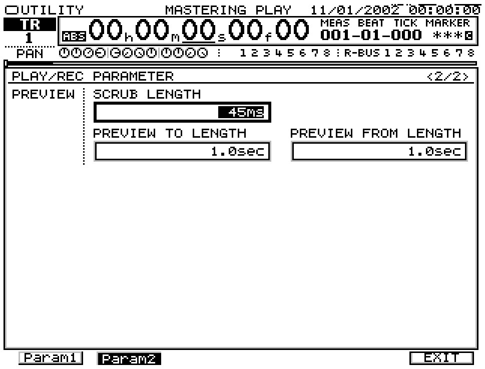
PLAYREC

UTILITY menu
F4 (PlyRec)


UTILITY
MASTERING PLAY 11/01/2002 00:00:00
TR 1
ABS 00h 00m 00s 00f 00
MEAS BEAT TICK MARKER
001-01-000 ***
PAN
1 2 3 4 5 6 7 8 R-BUS 1 2 3 4 5 6 7 8
Param1
Param2
EXIT

PLAY/REC PARAMETER <1/2>

RECORD MONITOR: Auto √Source
MARKER STOP: √Off On
FADE CURVE: √Linear Exp
FADE LENGTH: 2ms
VARI PITCH — VARI PITCH Sw: √Off On
VARI PITCH: 35.97KHz
SOLO/MUTE — SOLO/MUTE TYPE: All BUS Send


UTILITY
MASTERING PLAY 11/01/2002 00:00:00
TR 1
ABS 00h 00m 00s 00f 00
MEAS BEAT TICK MARKER
001-01-000 ***
PAN
1 2 3 4 5 6 7 8 R-BUS 1 2 3 4 5 6 7 8
Param1
Param2
EXIT

PLAY/REC PARAMETER <2/2>

PREVIEW — SCRUB LENGTH: 45ms
PREVIEW TO LENGTH: 1.0sec
PREVIEW FROM LENGTH: 1.0sec

RECORD MONITOR

RECORD MONITOR is explained in "Monitoring During Punching" on Page 185.

MARKER STOP

MARKER STOP lets you set the hard disk recorder so that it automatically stops when the now line reaches the next marker. This can be handy when you want the VS-2400CD to stop playback at the end of a section on which you're working: place a marker at the desired location and turn this parameter on. When MARKER STOP is off, the hard disk recorder operates normally.

FADE CURVE

When you record, punch in and out, and edit tracks, the VS-2400CD adds a very short crossfade between pieces of audio to ensure that there are no clicks or pops where they meet. The FADE CURVE parameter sets the shape of the crossfade. Set it to:

- *Linear*—so that the crossfade is linear in terms of digital audio data values.
- *Exp (Exponential)*—so that the crossfade is linear in terms of audibility.

FADE LENGTH

You can set the length of the crossfade described in FADE CURVE on the previous page. You can select 2ms, 10ms, 20ms, 30ms, 40ms or 50ms. The default setting is 10ms.

VARI PITCH

VARI PITCH Sw and VARI PITCH

The two VARI PITCH parameters are explained in "Vari Pitch Playback" on Page 176.

SOLO/MUTE

SOLO/MUTE TYPE

When you mute a channel—or when it's silenced as the result of another channel being soloed—you can set exactly where in the VS-2400CD its signal is stopped. This is determined by the setting of the SOLO/MUTE TYPE parameter. When it's set to:

- *All BUS Send*—the signal is stopped before it's sent to any Aux or Direct paths or the MASTER mix bus. It's therefore not sent to the VS-2400CD's effects or to outputs via Aux or Direct paths.
- *MIX BUS Send*—the signal is stopped before it goes to the MASTER bus only. It's still sent to the Aux and Direct paths, and thus to internal effects and/or outputs.

PREVIEW

SCRUB LENGTH

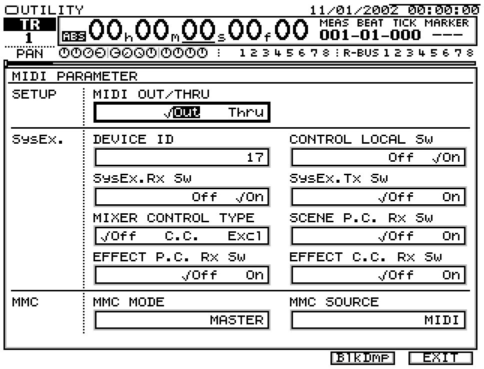
This parameter is explained in "Setting Scrub Times" on Page 179.

PREVIEW TO LENGTH and PREVIEW FROM LENGTH

These parameters are described in "Setting the PREVIEW TO and FROM Times" on Page 177.

MIDI

UTILITY menu
F5 (MIDI)


UTILITY
11/01/2002 00:00:00
TR 1
ABS 00h 00m 00s 00f 00
MEAS BEAT TICK MARKER
001-01-000 ---
PAN
1 2 3 4 5 6 7 8 : R-BUS 1 2 3 4 5 6 7 8
BlkDmp
EXIT

MIDI PARAMETER

SETUP
MIDI OUT/THRU: √Out Thru

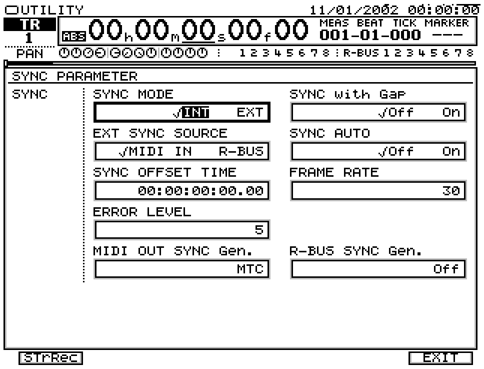
SysEx.
DEVICE ID: 17
CONTROL LOCAL Sw: Off √On
SysEx.Rx Sw: Off √On
SysEx.Tx Sw: √Off On
MIXER CONTROL TYPE: √Off C.C. Excl
SCENE P.C. Rx Sw: √Off On
EFFECT P.C. Rx Sw: √Off On
EFFECT C.C. Rx Sw: √Off On

MMC
MMC MODE: MASTER
MMC SOURCE: MIDI

The VS-2400CD's MIDI parameters and operations are described in Chapter 23, starting on Page 285. See the *VS-2400CD Owner's Manual* index for page numbers of specific parameter references.

SYNC

UTILITY menu
F6 (SYNC)


UTILITY
11/01/2002 00:00:00
TR 1
ABS 00h 00m 00s 00f 00
MEAS BEAT TICK MARKER
001-01-000 ---
PAN
1 2 3 4 5 6 7 8 : R-BUS 1 2 3 4 5 6 7 8
STrRec
EXIT

SYNC PARAMETER

SYNC
SYNC MODE: √INT EXT
SYNC with Gap: √Off On
EXT SYNC SOURCE: √MIDI IN R-BUS
SYNC AUTO: √Off On
SYNC OFFSET TIME: 00:00:00:00.00
FRAME RATE: 30
ERROR LEVEL: 5
MIDI OUT SYNC Gen.: MTC
R-BUS SYNC Gen.: Off

Synchronization parameters and operations are described starting on Page 293. See the *VS-2400CD Owner's Manual* index for page numbers of specific parameter references.

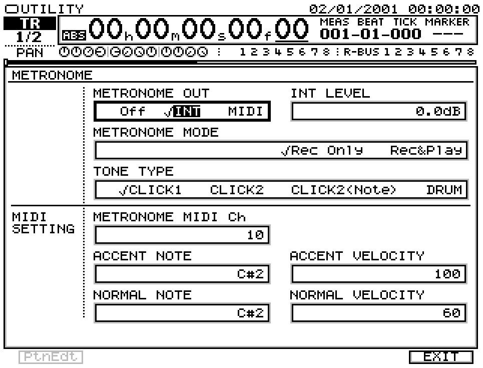
TEMPO

UTILITY menu
F1 (TEMPO)

"Synchronization with Tempo Changes" on Page 295 introduces the project tempo map. "Working with a Tempo Map" on Page 298 explains how to use it.

Metronome

UTILITY menu
F2 (Metro)



METRONOME

METRONOME OUT: Off √INT MIDI
INT LEVEL: 0.0dB
METRONOME MODE: √Rec Only Rec&Play
TONE TYPE: √CLICK1 CLICK2 CLICK2(Note) DRUM

MIDI SETTING

METRONOME MIDI Ch: 10
ACCENT NOTE: C#2
ACCENT VELOCITY: 100
NORMAL NOTE: C#2
NORMAL VELOCITY: 60

When you're using the project tempo map (see above), the VS-2400CD provides a built-in metronome you can use during recording and playback. The metronome's tempo comes from the tempo map, so the metronome slows down and speeds up along with the project tempo.

You can play the metronome internally using a variety of onboard sounds, including a simple, programmable beat box. You can send the metronome out to performers' headphones mixes. The metronome can also generate MIDI notes that play percussion sounds produced by an external MIDI device (Page 292).

When the metronome is used internally, it's normally sent to the VS-2400CD's MONITOR bus—in order to hear the metronome, therefore, you have to be listening to the MONITOR bus. You can also send the metronome to other VS-2400CD's outputs as described in "Sending the Metronome to Outputs" on Page 362.

METRONOME OUT

METRONOME OUT turns on the metronome and configures it for internal use or for MIDI use. You can set the parameter to Off, INT ("Internal") or MIDI.

INT LEVEL

When the metronome is being used internally, this parameter sets its volume, from -∞ to 6.0dB. the default setting is 0.0dB.

METRONOME MODE

You can set when the metronome plays. Set METRONOME MODE to:

- *Rec Only*—to play only when you're recording project tracks.
- *Rec&Play*—to play both during recording and playback of project tracks.

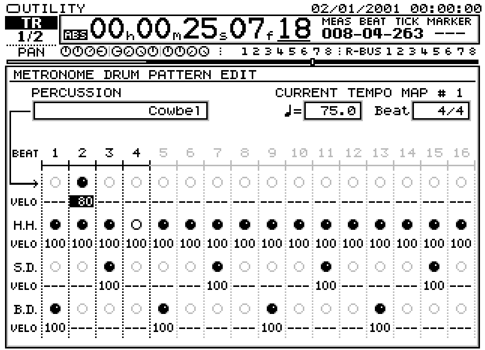
TONE TYPE

The metronome can play a variety of built-in sounds, as determined by the TONE TYPE parameter. Set it to:

- *CLICK1*—to play a pair of electronic ticks.
- *CLICK2*—to play a clave-like sound.
- *CLICK2(Note)*—to play a bass-drum like tone that derives its pitches from the metronome's ACCENT NOTE and NORMAL NOTE MIDI SETTINGS (Page 292).
- *DRUM*—to use the metronome's programmable beat box. When you select DRUM, F1 (PtnEdt), for "Pattern Edit," becomes active, as described below.

Programming the Metronome's Beat Box

When you've selected DRUM as the metronome's TONE TYPE parameter, you can press F1 (PtnEdt) to view the METRONOME DRUM PATTERN EDIT screen.


UTILITY 02/01/2001 00:00:00

TR 1/2 ABS 00h 00m 25s 07f 18 MEAS BEAT TICK MARKER 008-04-263 ---

METRONOME DRUM PATTERN EDIT

PERCUSSION: Cowbel

CURRENT TEMPO MAP # 1 ♩= 75.0 Beat 4/4

BEAT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	○	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○
VELO	---	80	---	---	---	---	---	---	---	---	---	---	---	---	---	---
H.H.	●	●	●	○	●	●	●	●	●	●	●	●	●	●	●	●
VELO	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
S.D.	○	○	●	○	○	○	●	○	○	○	●	○	○	○	●	○
VELO	---	---	100	---	---	---	100	---	---	---	100	---	---	---	100	---
B.D.	●	○	○	○	●	○	○	○	●	○	○	○	●	○	○	○
VELO	100	---	---	---	100	---	---	---	100	---	---	---	100	---	---	---

Pattern grid

You can play along with the pattern using the F buttons—the beat box pads. The sound each button plays is shown above it on the display.

Beat box pads

The beat box uses a simple grid of one measure's worth of quarter notes. A shiny black ball signifies a played note. The beat box has a bass drum ("B.D.") sound, a snare drum ("S.D."), closed and open hi-hat sounds (H.H) and any of three percussion sounds. To choose the percussion sound, select the PERCUSSION parameter and turn the Time/ Value dial to select Hand Clap, Cowbel or Maracas.

Each instrument has its own horizontal line of quarter notes. To make an instrument sound one of its quarter notes, cursor to the quarter note and turn the Time/Value dial clockwise so that a black ball appears. To silence the note, turn the Time/Value dial the other way to remove the black ball. For the hi-hat, dial in the black ball for a closed hi-hat sound, or an empty circle for an open hi-hat sound.

The CURRENT TEMPO MAP settings show the tempo and time signature of the tempo map at the now line's position when you first enter the beat box screen—the map number isn't updated when you stop and start playback while on the beat box's screen. Selecting, unselecting and re-selecting either the tempo or time signature parameter causes the tempo map settings to be updated to reflect the tempo map settings at the now line's current position.

Changing the tempo or time signature on the METRONOME DRUM PATTERN EDIT screen changes it in the tempo map as well, so be careful about any changes you make to these settings if you're using the Tempo Map feature for other purposes.

Sending the Metronome to Outputs

1. On the metronome's screen, set METRONOME OUT to INT.
2. Set its level, mode and sound as desired.
3. Press F6 (EXIT).
4. Press PAGE once.
5. Press F4 (OscAna)—the GENERATOR/OSCILLATOR screen appears.
6. Set the SOURCE parameter to METRONOME.
7. Set Sw, just above SOURCE, to On.
   With these settings, the generator produces the metronome's output signal. As you can see, the generator has its own set of CH EDIT-like parameters (Page 146) with which you can send the metronome to an Aux bus feeding a headphone mix, to the MASTER mix, or to a Direct path routed to a VS-2400CD output.

When the generator is producing the metronome’s sound, the metronome is no longer routed directly to the MONITOR bus.

AUTO PUNCH/LOOP

UTILITY menu
F3 (A.P/LP)

The AUTOPUNCH/LOOP screen provides parameters for setting Auto Punch and Loop start and stop times. To learn about using its parameters for:

- *Auto Punch*—see “Editing Auto Punch IN and OUT Points Manually” on Page 187.
- *Loop*—see “Editing Loop FROM and TO Points Manually” on Page 175.

MARKER

UTILITY menu
F4 (MARKER)

Learn how to use the UTILITY menu’s MARKER screen in “Editing Markers” on Page 184.

LOCATE

UTILITY menu
F5 (LOCATE)

The LOCATE screen is described in “Editing Locators” on Page 180.

V.FDR

UTILITY menu
F6 (V.FDR)

The parameters on the V.FADER screens determine the MIDI controllers to be transmitted from the VS-2400CD when its channel strips are in V.FADER mode.

“V.Fader—The VS-2400CD MIDI Control Surface” on Page 286 describes how to use the V.Fader feature that turns the VS-2400CD into a MIDI control surface.

At the top of the V.FADER/USER Param3 screen is the USER FADER ASSIGN to parameter, described in “Controlling a Parameter of Your Choice” on Page 136.

SCENE

UTILITY menu
F1 (SCENE)

To learn how to use the SCENE screen, see “Editing Scenes” on Page 141.

AUTOMIX

UTILITY menu
F2 (A.MIX)

See “The AUTOMIX Screen” on Page 314 to learn about using the AUTOMIX screen.

SURROUND

UTILITY menu F3 (Surrnd)

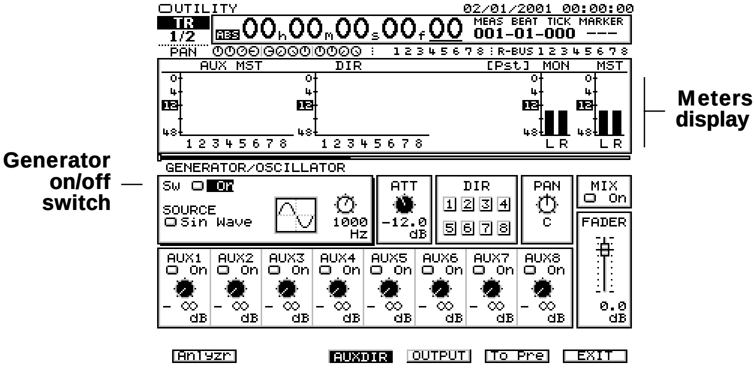
The SURROUND screen, and the use of Surround sound in the VS-2400CD, is described in Chapter 24. See "Turning on Surround Mode" on Page 309.

Oscillator/ANALYZER

UTILITY menu F4 (OscAna)

Pressing the OscAna button reveals the GENERATOR/OSCILLATOR screen and the VS-2400CD's test-signal generator. You can press F1 (Anylzr) to display the VS-2400CD's spectrum analyzer, described on Page 366. To exit either of the screens, press F6 (EXIT).

Generator


UTILITY
02/01/2001 00:00:00
TR 1/2
ABS 00h 00m 00s 00f 00
MEAS BEAT TICK MARKER
001-01-000 ---
PAN
AUX MST
DIR
[Pst] MON
MST
GENERATOR/OSCILLATOR
Sw On
SOURCE
Sin Wave
1000 Hz
ATT
-12.0 dB
DIR
1 2 3 4 5 6 7 8
PAN
C
MIX
On
FADER
0.0 dB
AUX1 AUX2 AUX3 AUX4 AUX5 AUX6 AUX7 AUX8
On
-∞ dB
Anlyzr
AUXDIR
OUTPUT
To Pre
EXIT
Meters display
Generator on/off switch

When you press the UTILITY menu's OscAna button, the GENERATOR/ OSCILLATOR screen appears. This screen controls the VS-2400CD's generator that produces various test signals and can produce the metronome's output.

When using the generator, start by choosing the desired test signal. Select the SOURCE parameter and turn the Time/Value dial to select:

- *Pink Noise*—a static-like noise comprised of the frequencies at each octave of the frequency spectrum sounding together at equal volume. Useful for testing speakers in conjunction with the VS-2400CD spectrum analyzer. See Page 367.
- *WhiteNoise*—a static-like noise comprised of all frequencies in the frequency spectrum sounding together at equal volume. Useful for testing speakers in conjunction with the VS-2400CD spectrum analyzer. See Page 367.
- *Sin Wave ("Sine Wave")*—the generator acts as an oscillator, producing a pure tone useful as a reference when you need to set levels using a fixed reference point. It's also helpful as a reference when sharing audio between multiple recorders to make sure they reproduce different frequencies similarly—the sine wave can be set to play at different frequencies. To set the sine wave's frequency, adjust the tuning knob that appears to the right of SOURCE when Sin Wave is selected.
- *METRONOME*—the VS-2400CD's internal metronome. "Sending the Metronome to Outputs" on Page 362 describes using the METRONOME setting.

When the generator is producing the metronome's sound, the metronome is no longer routed directly to the MONITOR bus.

To turn on the selected signal, turn the generator's on/off switch on. The GENERATOR/ OSCILLATOR screen provides a variety of controls that let you adjust and send the generator's output to the desired destination:

- *ATT*—attenuates the level produced by the generator from -42.0dB to 0.0dB.
- *AUX 1-8 sends*—let you send the generator's output to an effect or to an output, allowing you, for example, to send the metronome to an Aux bus feeding a headphone mix, as described on Page 362.

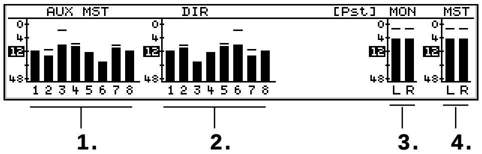
All of the generator's Aux sends are always after its fader regardless of the Aux bus's Pre/Pst configuration.

- *DIR 1-8*—let you route the generator's output to any Direct path.
- *PAN*—lets you adjust the panning of the generator's mono output when you're sending it into the MASTER mix.
- *MIX*—lets you send the generator's output into the MASTER mix (On), or remove it from the MASTER mix (Off).
- *FADER*—allows you to set the generator's final output level.

Metering on the GENERATOR/OSCILLATOR Screen

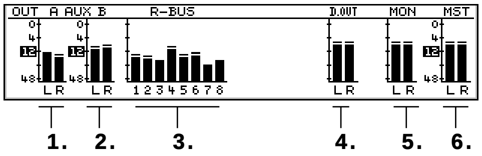
The GENERATOR/OSCILLATOR's meters display always shows the MASTER and MONITOR bus levels at the right. For the left part of the display, press:

- *F3 (AUXDIR)*—to view the eight Aux and eight Direct path levels.



1. **Aux Busses 1-8**
2. **Direct Paths 1-8**
3. **Stereo MONITOR bus**
4. **Stereo MASTER bus**

- *F4 (OUTPUT)*—to view the stereo analog Aux A and B outs, R-BUS outputs, and the coaxial/optical digital outputss.

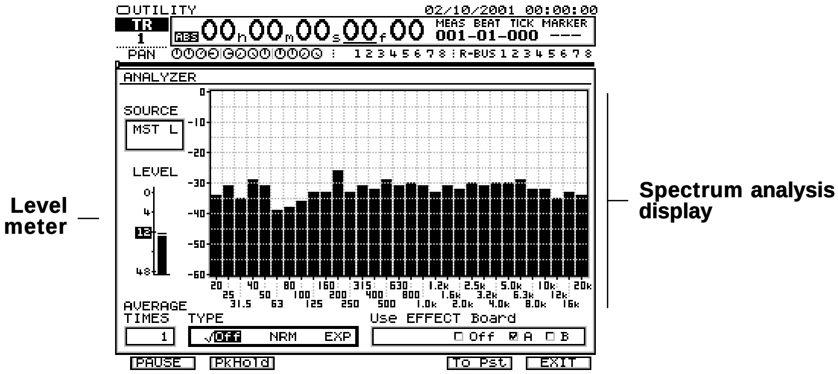


1. **Stereo Aux Output A**
2. **Stereo Aux Output B**
3. **R-BUS Digital Outputs 1-8**
4. **Stereo digital optical/coaxial outputs**
5. **Stereo MONITOR bus**
6. **Stereo MASTER bus**

You can select pre- or post-fader Aux bus and Direct path metering by pressing:

- *F5 (To Pre)*—to select pre-fader metering before the Aux bus and Direct path master level controls. See Page 201 and Page 203.
- F5 (To Pst)—to select post-fader metering, after the Aux bus and Direct path master level controls.

Analyzer


UTILITY
02/10/2001 00:00:00
TR 1
ABS 00h00m00s00f00
MEAS BEAT TICK MARKER
001-01-000 ---
PAN
1 2 3 4 5 6 7 8 R-BUS 1 2 3 4 5 6 7 8
ANALYZER
LEVEL
0 -10 -20 -30 -40 -50 -60
0 4 12 48
20 25 31.5 40 50 63 80 100 125 160 200 250 315 400 500 630 800 1.0k 1.2k 1.6k 2.0k 2.5k 3.2k 4.0k 5.0k 6.3k 8.0k 10k 12k 16k 20k
NRM EXP
PAUSE
PkHold
To Pst.
EXIT
Level meter
Spectrum analysis display

SOURCE MST L
AVERAGE TIMES 1
TYPE √Off
Use EFFECT Board ☐ Off ☑ A ☐ B

The analyzer performs a Fourier Fast Transform (FFT) analysis of a selected signal—the result of the analysis is shown in realtime on the spectrum analysis display.

Powering the Spectrum Analysis Display

The spectrum analysis display requires one of the VS-2400CD's VS8F-2 effect expansion boards to operate. Select the Use EFFECT board parameter, and turn the Time/Value dial to select the VS8F-2 you want to use. Press ENTER/YES to assign the effect board to the spectrum analyzer display.

When an effect board is being used by the spectrum analyzer display, it's unavailable for other use. For this reason, make sure to re-set Use EFFECT Board to Off—by selecting Off and pressing ENTER/YES—when you're done using the analyzer.

Understanding the Spectrum Analysis Display

Each frequency the spectrum analyzer displays is represented by a vertical bar on the screen—the frequency each bar represents is shown beneath it. A bar shows how loud its frequency is at the present moment in relation to the dB level scale shown up and down the left edge of the analyzer. If a frequency is completely absent from a signal, its bar doesn't light.

Setting Up the Spectrum Analysis Display

Select the SOURCE parameter and turn the Time/Value dial to select the signal you want to analyze. The analyzer works with any of the following mono signals:

- individual input and track channel signals
- the left or right side of the stereo FX return channel signals
- the generator/oscillator
- the left or right side of the stereo MASTER and MONITOR busses
- individual Aux bus and Direct path signals

When input or track channels or Aux busses are linked, the spectrum analyzer looks at each of the linked channels or busses individually.

The level meter at the left of the display shows the level of the signal being analyzed.

You can configure the analyzer to suit your needs. Set:

- *AVERAGE TIMES*—to set the smoothness of the display by causing it to update more frequently with shorter values, or less frequently with longer values. Lower values show fast frequency peaks more accurately, while longer values give you a broader view of the signal's frequency content.
- *TYPE*—to determine the type of analysis that's displayed. Generally, you'll want to use the Normal setting. Use Exp ("Exponential") for percussive signals.
- *F2 (PkHold) ("Peak Hold")*—press F2 (PkHold) so that it's highlighted to cause the analyzer to show a thin black bar representing each frequency's loudest peak. To turn off this feature, press F2 (PkHold) again.

As you analyze a signal, you can freeze the display by pressing F1 (PAUSE). To unfreeze it, press F1 (PAUSE) again.

Analyzing Your Speakers and Room

If you own or can borrow or rent a microphone designed for the measurement of frequency characteristics, you can use the spectrum analyzer to check the accuracy of your speakers in a specific listening environment.

You'll need to play pink noise—a sound that's a lot like static on a radio—loudly through your speakers when you analyze a listening environment. It's best to do this with no one around who hasn't explicitly agreed to participate in the process.

1. On the GENERATOR/OSCILLATOR screen (Page 364), set SOURCE to Pink Noise and turn the generator on/off switch (Sw) to On.
2. Set the generator's PAN to C, MIX to On, and set the FADER parameter to 0.0dB.
3. Connect a microphone to one of the VS-2400CD's inputs, and set up the microphone in the center of the listening space, where you—if you're analyzing your recording space—or a typical audience member—if you're analyzing a live performance venue—might sit.
4. Set the mic's signal level as you would any normal signal (Page 126).
5. Return to the GENERATOR/OSCILLATOR screen and press F1 (Anlyzr).
6. Set up the analyzer as described above, and set SOURCE to the input channel to which the mic's connected.
7. Examine the spectrum analyzer display to see if any frequencies are too loud or quiet. You can temporarily set SOURCE to Gen/Osc to see what the pink noise *should* look like.

Correcting Problems

You can correct most problems by inserting a stereo graphic EQ—such as Effect Patch P031—on the VS-2400CD's MASTER bus. You can adjust the sound of the speakers using the graphic EQ's settings, returning frequently to the analyzer to check your work.

If you're having trouble correcting a problem, try analyzing the sound of each monitor by pointing the mic straight at it. Return to the center perspective for a final check.

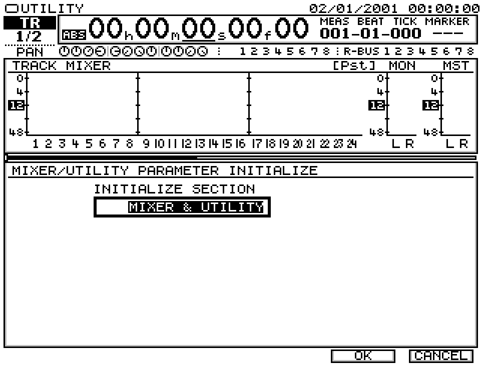
DATE/TIME

UTILITY menu F5 (DATE)

To learn how to set the VS-2400CD's calendar and clock that time-stamp your recordings, see "Setting the VS-2400CD's Clock" on Page 65.

Parameter Initialization

UTILITY menu F6 (PrmIni)



MIXER/UTILITY PARAMETER INITIALIZE

INITIALIZE SECTION: MIXER & UTILITY

Use the MIXER/UTILITY PARAMETER INITIALIZE screen to reset many of the VS-2400CD's mixer and/or UTILITY menu parameters to their default factory settings. You may want to do this to start over with a clean slate, or if your VS-2400CD is behaving oddly, and you suspect that some unknown parameter value may be the cause.

This screen doesn't initialize all mixer and/or UTILITY menu settings. Your basic project settings remain, including your current IDE drive selection. Scenes, the tempo map and sync track, LOCATOR/SCENE TYPE, SHIFT LOCK and NUMERICS TYPE parameters are among the settings that aren't initialized.

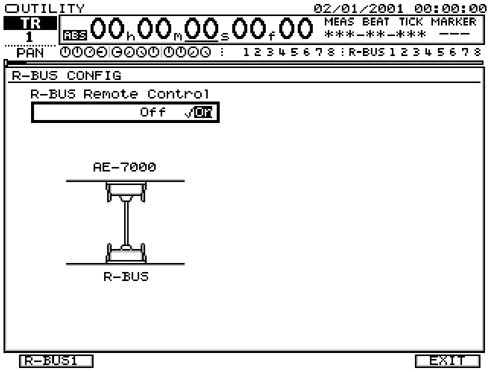
Resetting Mixer and UTILITY Parameters

1. Press UTILITY.
2. Press PAGE until "PrmIni" appears above F6.
3. Press F6 (PrmIni).
4. Turn the Time/Value dial to select:
   - *MIXER & UTILITY*—to initialize both the mixer and UTILITY parameters.
   - *MIXER*—to initialize only the mixer parameters.
   - *UTILITY*—to initialize only the UTILITY parameters.
5. Press F5 (OK)—a confirmation screen appears.
6. If you're sure you want to proceed, press ENTER/YES. To cancel the operation, press EXIT/NO.

If this procedure doesn't cure your VS-2400CD's odd behavior, call Roland Product Support at 323-890-3740, x3741.

R-BUS

UTILITY menu
F1 (R-BUS)



R-BUS Remote Control: Off √On

On this screen, you can activate remote control of an R-BUS device connected to the R-BUS jack (Page 50). You can also set the device's configuration parameters. To turn on remote control of an R-BUS device, turn on the remote control parameter for the R-BUS jack to which it's connected.

If a Roland RPC-1 (R-BUS PCI card) is connected to an R-BUS connector, turn its remote control parameter off if it isn't turned off already.

Once you've activated the device's remote control, display its setup parameters by pressing *F1 (R-BUS)*—to display the configuration screen for the device connected to the VS-2400CD's R-BUS jack.

F1 (R-BUS) appears only when a remote-controllable R-BUS device is connected to the R-BUS jack and remote control is turned on.

In the "Supplemental Information" chapter, you'll learn how to set each R-BUS device's configuration parameters. See:

- "DIF-AT Settings" on Page 441.
- "AE-7000 Settings" on Page 444.
- "ADA-7000 Settings" on Page 443.
- "VSR-880 Settings" on Page 446.

If you're using a DIF-AT, see "Using a Roland DIF-AT" on Page 442.

RSS PAN SETUP

UTILITY menu
F2 (RSSPan)

The VS-2400CD's RSS Pan effect algorithm allows you to add depth to your recordings. See "RSS PAN" on Page 220 to learn more about using the RSS Pan feature.

28—Expanding the VS-2400CD

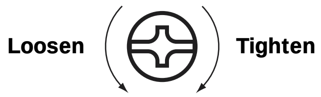
Installing a VS8F-2 Effect Expansion Board

The VS-2400CD ships from the factory with one VS8F-2 effect expansion board—this board produces stereo Effects 1 and 2. You can install an VS8F-2—sold separately—for a total of four stereo effects, or 8 mono effects.

Installation Precautions

Install only the specified circuit board(s), Model No. VS8F-2. Remove only the specified screws.

- To avoid damaging internal components as a result of static electricity, please carefully observe the following precautions whenever you handle a VS8F-2.
  - Before you touch the board, always first touch a metal object—such as a water pipe—so you're sure any static electricity you may have been carrying is discharged before you touch the VS8F-2.
  - When handling the board, grasp it only by its edges. Avoid touching any of its electronic components or connectors.
  - Save the bag in which the VS8F-2 was shipped, and put the board back into the bag should you need to store or transport the board.
- Use the correct Phillips screwdriver—a Number 2 screwdriver—for the size of the VS-2400CD's screws. The head of the screw may become stripped if you use the wrong screwdriver.
- To remove a screw, turn the screwdriver counter-clockwise. To tighten a screw, turn the screwdriver clockwise.



- When installing a VS8F-2 effect expansion board, remove only the specified screws.
- Be careful that the screws you remove do not drop into the interior of the VS-2400CD.
- Re-attach the VS-2400CD's bottom cover after the installation—do not leave its internal components exposed.
- Do not touch any printed circuit pathways or connection terminals.
- Be careful not to cut your hand on the edge of the installation bay.
- Never use excessive force when installing a VS8F-2. If it doesn't fit properly on the first attempt, remove the board, re-position it and try again.
- When the VS8F-2 installation is complete, double-check your work before replacing the VS-2400CD's bottom cover.

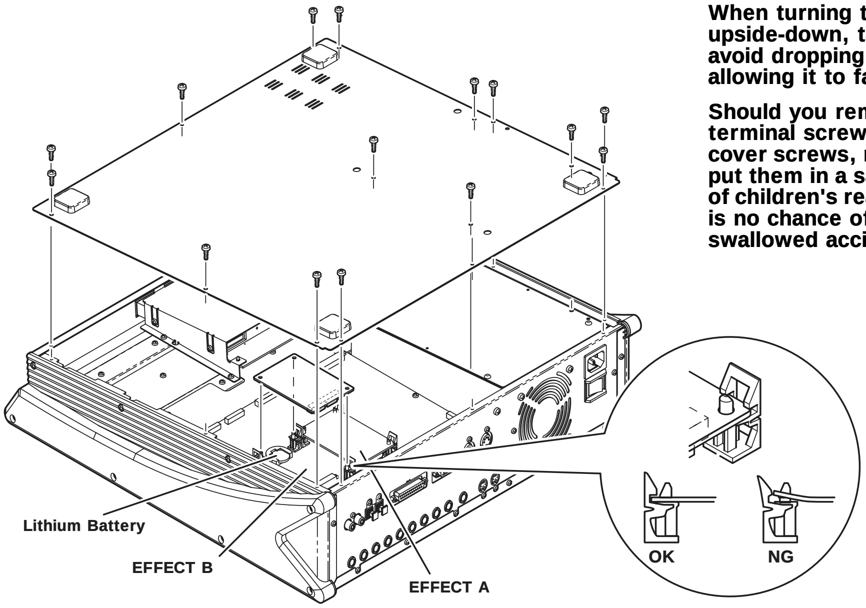
Before turning the VS-2400CD upside-down to install a VS8F-2, obtain some newspapers or magazines and place them under the four corners of the VS-2400CD—or at both ends—to prevent damage to the buttons and controls. Position the VS-2400CD carefully to avoid scratching or damaging it.

Installation Procedure

Always turn the unit off and unplug the power cord before attempting installation of the circuit board (VS8F-2, Page 78).

During installation of a VS8F-2, be careful not to touch the VS-2400CD’s battery.

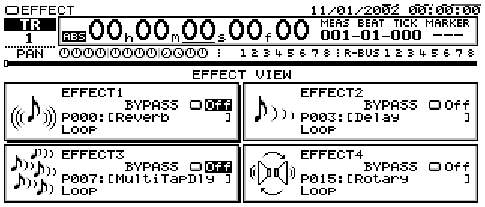
1. Before installing the VS8F-2, turn off the power of the VS-2400CD (Page 78) and all connected devices, and disconnect all cables from the VS-2400CD.
2. Turn the VS-2400CD over onto its back, and remove only the screws shown in the following diagram.



When turning the unit upside-down, take care to avoid dropping it or allowing it to fall over.

Should you remove ground terminal screw and bottom cover screws, make sure to put them in a safe place out of children's reach, so there is no chance of them being swallowed accidentally.

3. Inside the VS-2400CD, there are two connectors and 6 plastic pins for the VS8F-2. Insert the connectors of the VS8F-2 into the internal connectors, and simultaneously insert the plastic pins into the holes of the VS8F-2 to fasten the unit in place.
4. Use the screws that you removed in Step 2 to re-fasten the bottom cover.
5. Connect the cables that you disconnected earlier.
6. Turn on the power, as described on Page 63.
7. After powering up the VS-2400CD, hold down SHIFT and press F3 (EFFECT), and confirm that you see effect patch symbols for Effects 1, 2, 3 and 4.



```
EFFECT                                   11/01/2002 00:00:00
TR                                       MEAS BEAT TICK MARKER
1    ABS 00h00m00s00f00                  001-01-000 ---
PAN                    :  1 2 3 4 5 6 7 8 : R-BUS 1 2 3 4 5 6 7 8
                         EFFECT VIEW
EFFECT1                        EFFECT2
        BYPASS  Off                    BYPASS  Off
P000:[Reverb           ]       P003:[Delay            ]
Loop                           Loop
EFFECT3                        EFFECT4
        BYPASS  Off                    BYPASS  Off
P007:[MultiTapDly      ]       P015:[Rotary           ]
Loop                           Loop
```

If the effect produced by an installed VS8F-2 is missing—and the screen shows “No EFFECT Board” instead—the VS-2400CD is not correctly recognizing the VS8F-2. Re-install the VS8F-2.

French language
for Canadian Safety Standard

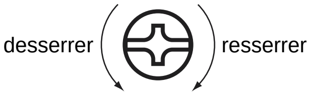
Installation de la carte d’extension d’effets
(French language for Canadian Safety Standard)

Quand une ou deux cartes VS8F-2 sont installées, il est possible d’utiliser jusqu’à 2 effets stéréo pour chaque carte sans brancher aucun équipement additionnel au VS-2400CD. Deux de ces cartes peuvent être installées dans le VS-2400CD. Il est recommandé d’installer au moins une carte d’extension à effet pour pouvoir utiliser pleinement le VS-2400CD.

Précautions lors de l’installation de la carte d’extension d’effets

N’installez que les cartes de circuits imprimes spécifiées (VS8F-2). Enlevez seulement les vis indiquées.

- Veuillez suivre attentivement les instructions suivantes quand vous manipulez la carte afin d’éviter tout risque d’endommagement des pièces internes par l’électricité statique.
  - Toujours toucher un objet métallique relié à la terre (comme un tuyau par exemple) avant de manipuler la carte pour vous décharger de l’électricité statique que vous auriez pu accumuler.
  - Lorsque vous manipulez la carte, la tenir par les côtés. Évitez de toucher aux composants ou aux connecteurs.
  - Conservez le sachet d’origine dans lequel était la carte lors de l’envoi et remettez la carte dedans si vous devez la ranger ou la transporter.
- Utiliser un tournevis cruciforme correspondant à la taille de la vis (un tournevis numéro 2). En cas d’utilisation d’un tournevis inapproprié, la tête de la vis pourrait être endommagée.
- Pour enlever les vis, tourner le tournevis dans le sens contraire des aiguilles d’une montre. Pour resserrer, tourner dans le sens des aiguilles d’une montre.



- Veillez à ne pas laisser tomber de vis dans le châssis du VS-2400CD.
- Ne pas laisser le panneau de protection avant détaché. S’assurer de l’avoir rattacher après avoir installé le disque dur.
- Ne pas toucher aux circuits imprimés ou aux connecteurs.
- Veillez à ne pas vous couper les doitgs sur le bord de l’ouverture d’installation.
- Ne jamais forcer lors de l’installation de la carte de circuits imprimés. Si la carte s’ajuste mal au premier essai, enlevez la carte et recommencez l’installation.
- Quand l’installation de la carte de circuits imprimés est terminée, revérifiez si tout est bien installé.
- Toujours éteindre et débrancher l’appareil avant de commencer l’installation de la carte.

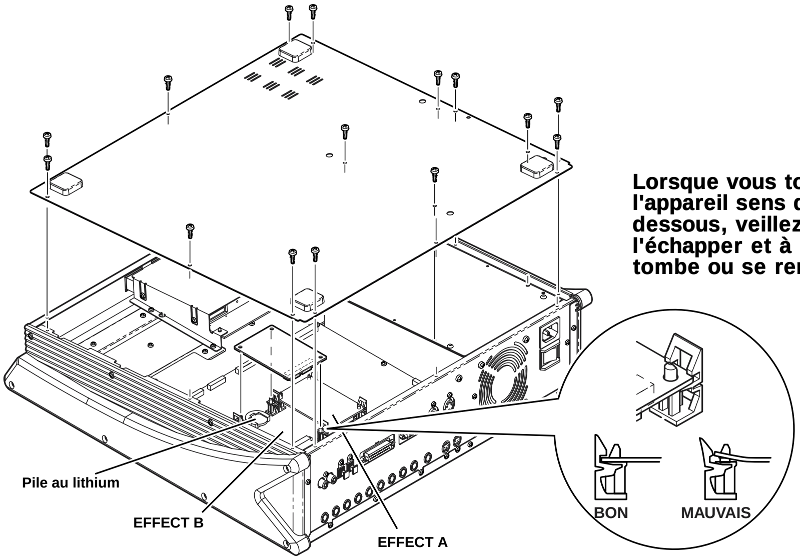
Avant de tourner le VS-2400CD sens dessus-dessous, déposez des journaux ou des magazines sous les quatre coins ou aux deux extrémités pour éviter d'endommager les boutons et contrôles. Assurez-vous aussi de placer l'appareil de façon à ce que les boutons et contrôles ne soient pas endommagés.

Procédure d'installation

Toujours éteindre et débrancher l’appareil avant de commencer l’installation de la carte. (VS8F-2; Page 78).

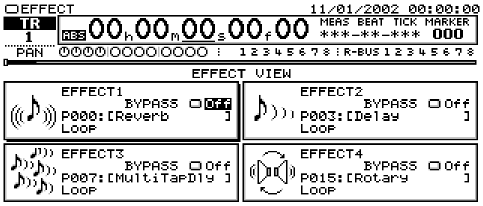
Pendant l'installation d'une carte VS8F-2, prenez soin de ne pas toucher la pile du VS-2400CDÕ.

1. Avant d'installer la carte VS8F-2, mettez hors tension le VS-2400CD (Page 78) et tous les périphériques connectés, et débranchez tous les câbles du VS-2400CD.
2. Tournez le VS-2400CD sens dessus-dessous et retirez uniquement les vis indiquées dans le schéma ci-dessous.



Lorsque vous tournez l'appareil sens dessus-dessous, veillez à ne pas l'échapper et à éviter qu'il tombe ou se renverse.

3. À l'intérieur du VS-2400CD, il existe deux connecteurs et 6 goupilles en plastique pour la carte VS8F-2. Glissez les connecteurs de la carte VS8F-2 dans les connecteurs internes et insérez simultanément les goupilles en plastique dans les trous de la carte pour la retenir en place.
4. Utilisez les vis retirées à l'étape 2 pour remettre le couvercle inférieur en place.
5. Rebranchez les câbles que vous avez débranchés.
6. Mettez l'appareil sous tension (Page 63).
7. Après avoir redémarré le VS-2400CD, tenez la touche Maj enfoncée et appuyez sur la touche F3 (EFFECT) pour vérifier que les icônes pour les effets 1, 2, 3 et 4 s'affichent.



```
EFFECT                                    11/01/2002 00:00:00
TR   ABS 00h00m00s00f00   MEAS BEAT TICK MARKER
 1                        ***-**-***    000
PAN                    :  1 2 3 4 5 6 7 8 :R-BUS 1 2 3 4 5 6 7 8
                         EFFECT VIEW
EFFECT1                         EFFECT2
          BYPASS  Off                     BYPASS  Off
P000:[Reverb       ]            P003:[Delay        ]
Loop                            Loop
EFFECT3                         EFFECT4
          BYPASS  Off                     BYPASS  Off
P007:[MultiTapDly  ]            P015:[Rotary       ]
Loop                            Loop
```

Si l'installation de la carte VS8F-2 ne produit aucun effet et que l'écran affiche « No EFFECT Board », cela signifie que le VS-2400CD ne reconnaît pas la carte VS8F-2. Réinstallez alors la carte VS8F-2.

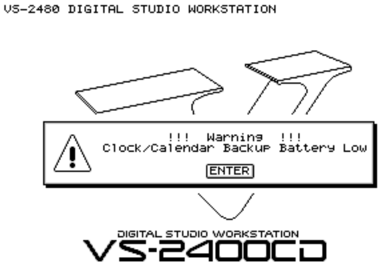
Connecting an MB-24 Level Meter

1. With the power to the VS-2400CD and the MB24 turned off, connect the VS-2400CD's MIDI OUT to the MB-24's MIDI IN using a MIDI cable.
2. If you want to connect another MIDI device to the VS-2400CD, connect its input to the MB-24's MIDI THRU jack using a MIDI cable.
3. Turn on the power to your devices.

When using the MB-24, set the VS-2400CD's MIDI OUT/THRU parameter to Out (Page 286). To learn how to configure the meter bridge, see the "EXTERNAL LEVEL METER" parameter section on Page 352.

Replacing the VS-2400CD's Battery

The VS-2400CD contains a lithium battery that powers its time-keeping features, and also provides the power for the area of the VS-2400CD's memory that stores certain parameter values. When the battery weakens, the VS-2400CD's time-keeping features may not operate correctly, and it may not properly remember various settings upon power-up. If the battery needs to be replaced, the VS-2400CD shows the following message when you power up:


VS-2480 DIGITAL STUDIO WORKSTATION
ENTER
DIGITAL STUDIO WORKSTATION
VS-2400CD

!!! Warning !!!
Clock/Calendar Backup Battery Low

Use only the specified type (model no. CR2032) of lithium battery. Be sure to insert it as directed (to ensure correct polarity).

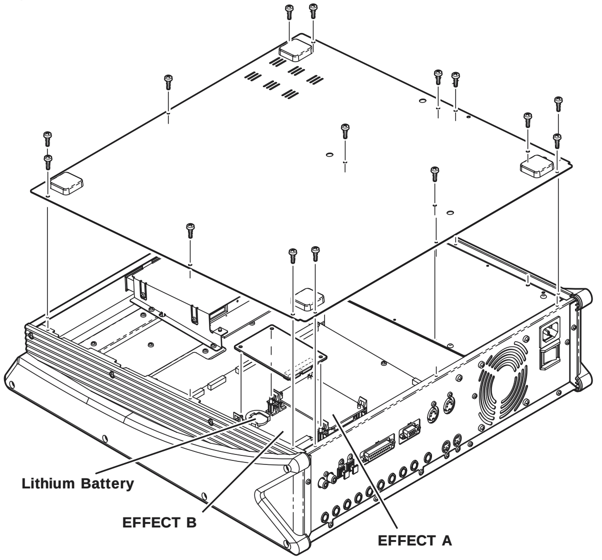
Before turning the VS-2400CD upside-down to install a new battery, obtain some newspapers or magazines and place them under the four corners of the VS-2400CD, or at both ends, to prevent damage to the buttons and controls. Position the VS-2400CD carefully to avoid scratching or damaging it.

When installing a new battery, follow the precautions listed on Page 371.

Installation Procedure

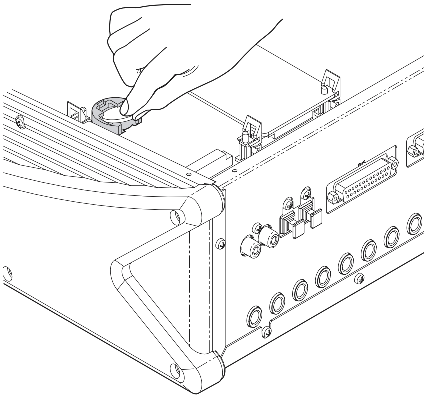
1. Power down the VS-2400CD (Page 78), saving any recent changes you've made to the currently loaded project.
2. Turn off all connected devices, and disconnect all cables from VS-2400CD.

3. Turn the VS-2400CD over onto its back, and remove only the screws shown in the following illustration.



Should you remove battery and screws, make sure to put them in a safe place out of children's reach, so there is no chance of them being swallowed accidentally.

4. The battery should now be visible, as shown here.
5. Remove the VS8F-2 for Effect B.
6. Replace the old battery with a new one.



The VS-2400CD uses a lithium CR2032 battery that you can purchase at most electronics stores.

7. Reinstall the effect expansion board (VS8F-2) removed in Step 5. Insert the plastic pins into the VS8F-2's holes, making sure the board is securely fastened in place.
8. Use the screws that you removed in Step 3 to re-fasten the VS-2400CD's bottom cover. This completes the process of exchanging the lithium battery.
9. Connect the cables that you disconnected earlier.
10. Turn on the power, as described in "Powering Up" on Page 63.
11. Confirm that the message saying the lithium battery is depleted no longer appears in the display.
12. Hold down SHIFT and press F3 (EFFECT), and verify that effect patch symbols for Effects 1 and 2 are visible. If they're not, re-install the VS8F-2 card you removed in Step 5 (see Page 371 for help).

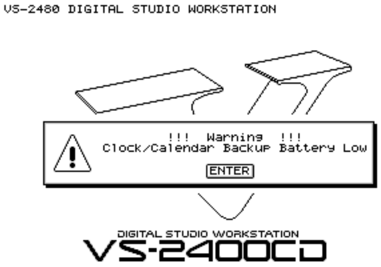
The VS-2400CD's clock is powered by its battery. Changing the battery may stop the clock or cause it to display the wrong time or date.

13. Reset the VS-2400CD's clock and calendar (Page 65).

French language
for Canadian Safety Standard

Remplacement de la pile du VS-2400CD.fs
(French language for Canadian Safety Standard)

Le VS-2400CD renferme une pile au lithium qui alimente ses dispositifs de chronométrage; la pile alimente aussi les secteurs de la mémoire du VS-2400CD™fs où sont stockées certaines valeurs des paramètres. Lorsque la pile faiblit, les dispositifs de chronométrage du VS-2400CD™fs ne peuvent pas fonctionner correctement et il est possible qu'il ne se rappelle pas certains paramètres au démarrage. Le VS-2400CD affiche le message suivant au démarrage lorsqu'il est nécessaire de remplacer la pile :


VS-2480 DIGITAL STUDIO WORKSTATION
ENTER
DIGITAL STUDIO WORKSTATION
VS-2400CD

!!! Warning !!!
Clock/Calendar Backup Battery Low

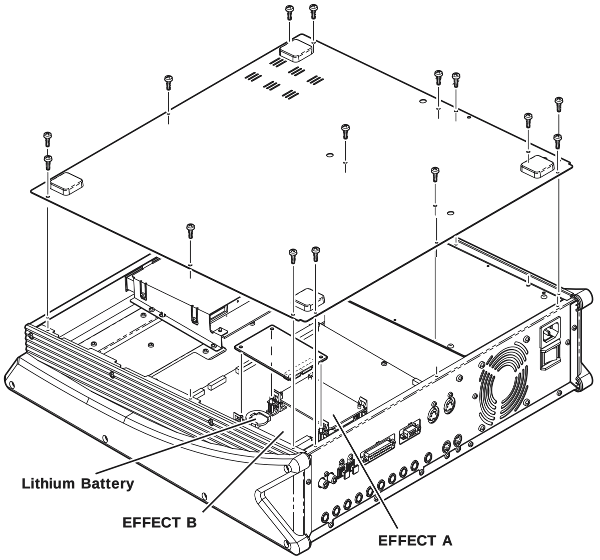
Avant de tourner le VS-2400CD sens dessus-dessous pour installer une nouvelle pile, déposez des journaux ou des magazines sous les quatre coins ou aux deux extrémités pour éviter d'endommager les boutons et contrôles. Déposez le VS-2400CD soigneusement pour éviter de l'égratigner ou de l'endommager.

Lorsque vous installez une nouvelle pile, prenez les précautions mentionnées à la Page 371.

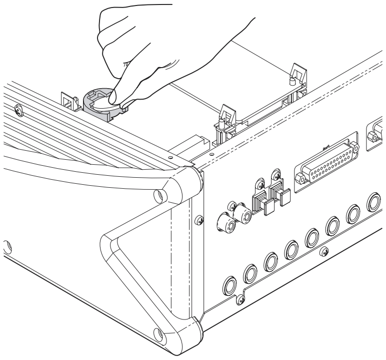
Procédure d'installation

1. Mettez le VS-2400CD hors tension (Page 78) après avoir enregistré toutes les modifications récentes apportées au projet en cours.
2. Mettez hors tension tous les périphériques connectés et débranchez tous les câbles du VS-2400CD.

3. Tournez le VS-2400CD sens dessus-dessous et retirez uniquement les vis indiquées dans l'illustration ci-dessous.



4. Vous devriez maintenant apercevoir la pile, comme le montre l'illustration.
5. Retirez la carte VS8F-2 pour l'effet B.
6. Remplacez la pile usée par une nouvelle.



Le VS-2400CD utilise une pile au lithium CR2032 offerte dans presque tous les magasins d'appareils électroniques.

7. Réinstallez la carte d'expansion d'effets (VS8F-2) retirée à l'étape 5. Insérez les goupilles en plastique dans les trous de la carte VS8F-2™fs et assurez-vous qu'elle est fixée solidement.
8. Remettez en place et fixez le couvercle inférieur du VS-2400CD™fs à l'aide des vis retirées à l'étape 3. Le changement de pile au lithium est terminé.
9. Rebranchez les câbles que vous avez débranchés.
10. Mettez le VS-2400CD sous tension en procédant comme indiqué dans “Powering Up” on Page 63.
11. Assurez-vous que le message indiquant que la pile au lithium est vide ne s'affiche plus à l'écran.
12. Appuyez sur EFFECT et assurez-vous que les icônes Effects 1 et 2 s'affichent. Sinon, réinstallez la carte VS8F-2 retirée à l'étape 5 (reportez-vous à la Page 371).

L'horloge du VS-2400CD™fs est alimentée par la pile. Changer la pile peut arrêter l'horloge ou faire en sorte que la date ou l'heure affichées sont erronées.

13. Réglez l'horloge et le calendrier du VS-2400CD™fs (Page 65).

29—Using a VGA Monitor: Overview

About Chapters 29-35

The remaining chapters describe how to use a color VGA monitor (purchased separately) with your VS-2400CD. When the VGA is selected as your main display, you can perform almost every VS-2400CD operation on the VGA using your mouse. These operations have already been explained in detail in Chapters 1-28. Therefore, in the following chapters we'll point you to the relevant page or pages to avoid repetition. We'll do this in one of two ways:

- When groups of items are presented in lists, the pages on which they're explained will be shown at their right.
- In other cases, we'll use the double-arrow symbol shown here. In this example, we'd be directing you to Page 123.

Page 123

The Main Display and the Info Display

Whenever an external VGA monitor is connected, the VS-2400CD provides a main display and an Info Display. The:

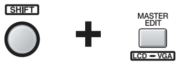
- *main display*—is where you work. Interact with the main display using your mouse, keyboard and the VS-2400CD's top-panel controls. All messages appear here.
- *Info Display*—is a non-interactive screen that provides helpful supplemental information. See Page 382 to learn how to set the contents of the Info Display.

You can select the VGA display or the LCD display as the main display, but not both at the same time. When you select the main display—by setting the OPERATION TARGET parameter—the other display is automatically designated as the Info Display.

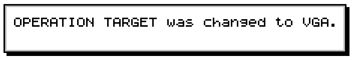
Setting the Operation Target

The VS-2400CD displays the currently selected operation target when it powers up.

You can toggle between the two OPERATION TARGET settings—VGA or LCD—by holding down SHIFT and pressing the LCD↔VGA button. Each time you reset the OPERATION TARGET, the previously selected main display confirms the change.

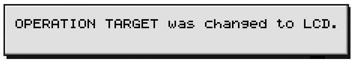


The internal LCD shows:



OPERATION TARGET was changed to VGA.

The external VGA shows:

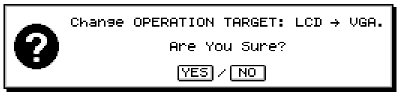


OPERATION TARGET was changed to LCD.

Manually Setting the OPERATION TARGET Parameter

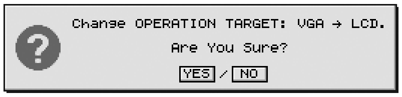
1. Hold down SHIFT and press F4•UTILITY.
2. If "SYSTEM" isn't visible above F1, press PAGE until it is.
3. Press F1 (SYSTEM).
4. Press F2 (Param2) and locate the OPERATION TARGET parameter.

5. Set OPERATION TARGET to VGA or LCD. On the main display, you see.



Change OPERATION TARGET: LCD → VGA.
Are You Sure?
YES / NO

or



Change OPERATION TARGET: VGA → LCD.
Are You Sure?
YES / NO

6. Press ENTER/YES to proceed, or EXIT/NO to cancel the change.

About the Main Display

The LCD as Main Display

Chapters 1-28 describe the behavior of the LCD when it acts as the main display.

The VGA as Main Display

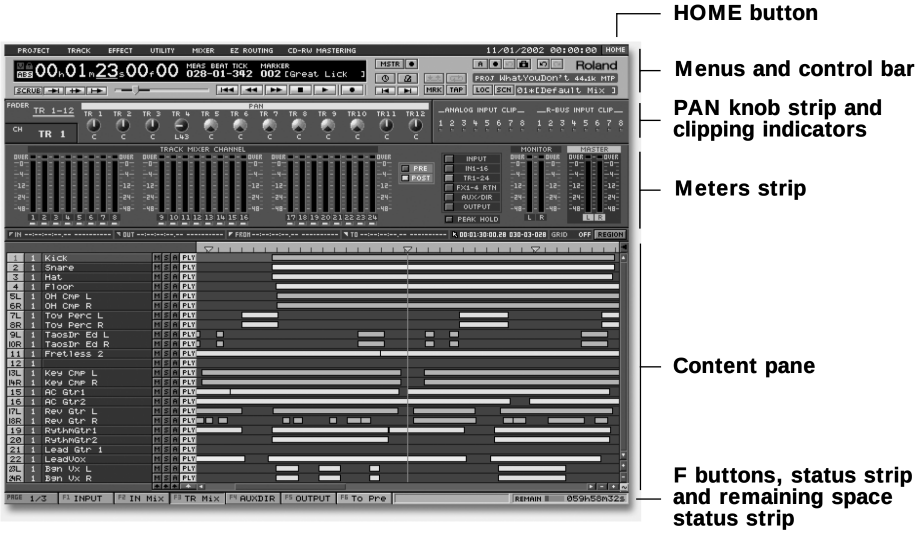
With a connected external VGA display, your mouse and keyboard become your main tools and the VS-2400CD acts as a full-featured control surface. Its faders, knobs and buttons provide a great way to physically interact with what's on the VGA display:

- Select channels and parameters on the VGA with your mouse, and change their settings using the VS-2400CD's faders or knobs if you wish.
- Use the VS-2400CD's transport buttons (Page 171) to operate the hard disk recorder as you work on the VGA display.
- Select audio or other data on the VGA using your mouse, and undo any edit using the top panel's UNDO•REDO button or its onscreen counterparts.
- Use the VS-2400CD's LCD as a secondary Info Display on which you can keep important information in view as you work on the VGA.

Of course, there's no single "correct" way to use all of the VS-2400CD's available tools—odds are you'll intuitively develop the easiest, fastest way to work for your needs.

Areas of the VGA Main Display

When the VGA acts as the main display, it's comprised of several different areas, described in detail in the following chapters.


HOME button
Menus and control bar
PAN knob strip and clipping indicators
Meters strip
Content pane
F buttons, status strip and remaining space status strip

On the VGA main display Home screen—shown here—the lower pane contains the project playlist, described in Chapter 31.

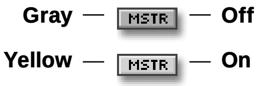
Some of these areas are always available and some change, as described later:

- *Menus, control bar, F buttons, status strip and remaining space status strip*—are always visible on the VGA. See Chapter 30.
- *PAN knob strip and clipping indicators*—are always visible on the VGA. See Chapter 30.
- *The meters strip*—shows the currently selected level meters. See Chapter 31.
- *Content pane*—the contents of this area change as described in Chapters 31-35.

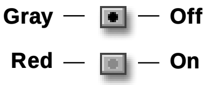
The VGA's Main Display Home Screen

Like the LCD, the VGA main display has its own Home screen, shown on the previous page. You can return to the Home screen at any time by clicking the HOME button in the upper right-hand corner of the display (as shown on Page 380), the HOME•DISPLAY button on the VS-2400CD or the Home button on your keyboard.

Button Colors on the VGA Main Display



The VGA contains a wide assortment of on/off switches, presented as clickable buttons. Unless otherwise noted, when a button is switched on, it turns yellow—when it's off, it's gray.



The transport REC button and the Mastering Room and Automix Record buttons behave a little differently: they turn red when activated.

Interaction with the VS-2400CD's Top-Panel Controls

The VS-2400CD's top-panel buttons generally interact with the currently selected main display as described in Chapters 1-28. When the VGA is selected as the main display, however, there are a few minor differences:

- Press the PROJECT, TRACK, EFFECT or UTILITY MENU F buttons on the VS-2400CD to display the corresponding menu on the VGA. To close a menu, press EXIT/NO.
- The FADER buttons—IN 1-12, IN 13-16, Tr 1-12, TR 13-24, AUX 1-8/FX 1-4 (Page 133)—choose the channels to which the main display's PAN knob strip is assigned (Page 393). In the VGA's Multi Channel Strip View screen, the FADER buttons select the channels to be displayed.
- The Home screen's fader/ pan buttons determine what's displayed in the lower part of the screen. Press:
  - *IN F/P*—to display the Input Mixer and Master Block.
  - *TR F/P*—to display the Track Mixer and FX Return Mixer.
  - *MltChv*—to display the Multi Channel Strip View of the currently selected channels.

Sub-Windows

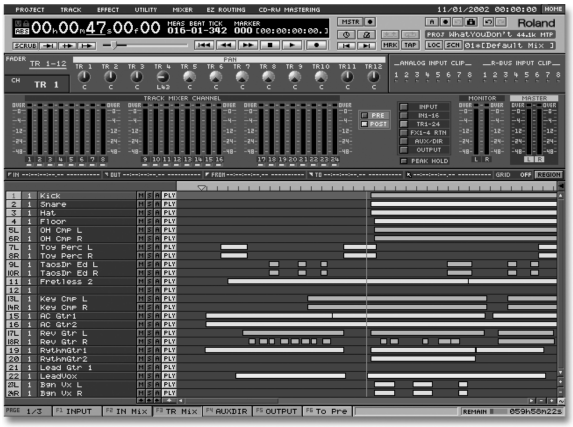
In some cases, when you click a button on the VGA main display or select a menu item, a window opens that looks just like the corresponding screen on the VS-2400CD's LCD, with the same F buttons available at the bottom of the window. The contents of the window behave the same way they do on the VS-2400CD's LCD. You can exit the screen by clicking the box in its upper-left corner or by pressing F6 (EXIT).

About the Info Display

You can choose what you'd like to see on the Info Display using the PAGE and F buttons (see Page 67 and Page 66, respectively). You can press these buttons on the VS-2400CD or click them on the VGA display.

When the VGA is Designated as the Info Display

Most of the VGA Info Display's screens are divided into four areas.



VGA control bar

PAN knob strip

Meters strip

Bottom pane

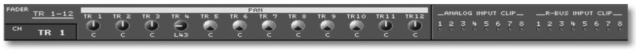
The Info Display also provides a date and time readout in its upper right-hand corner.

VGA Control Bar

The VGA control bar is described in Chapter 30, starting on Page 390.

PAN Knob Strip

Currently selected channel group


FADER
TR 1–12
CH
TR 1
PAN
ANALOG INPUT CLIP
R-BUS INPUT CLIP

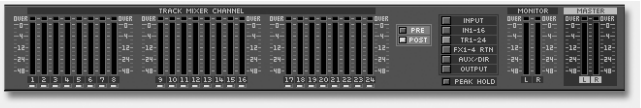
Clipping indicators

PAN knob settings

This strip shows the selected channels' current PAN settings. At the left of the strip, the currently selected channel group and channel are shown. To the right of the strip are input clipping indicators that show when a channel's input signal level is too loud.

Meters Strip

In certain display modes—see "Selecting Info Displays Manually" below—the meters strip shows the set of meters currently selected on the Home screen.


TRACK MIXER CHANNEL
PRE
POST
INPUT
IN1-16
TR1-24
FX1-4 RTN
AUX/DIR
OUTPUT
PEAK HOLD
MONITOR
MASTER

Whenever the meters strip is visible, meters for the MONITOR and MASTER busses appear at its right.

Currently selected meters

Bottom Pane

The contents of the Info Display's bottom pane changes from screen to screen.

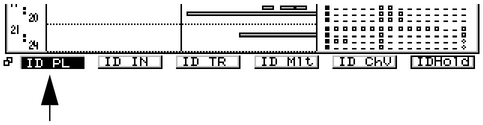
Controlling What's On the Info Display

As you navigate the VS-2400CD's LCD display, the Info Display automatically switches between various screens. You can manually switch to a few key screens, and you can lock the display so that it doesn't change as you move around on the VS-2400CD.

Selecting Info Displays Manually

You can access several key screens from the VS-2400CD's Home screen.

1. Press HOME/DISPLAY.
2. Press PAGE until "ID PL" appears above the F1 button.



3. You can press F1 through F5 to view the following screens:
    - *ID PL (Info Display Playlist screen)*—shows the track playlist in the lower area on the display.
    - *ID IN (Info Display Input Channels)*—shows all 16 input channels in the lower area on the display.
    - *ID TR (Info Display Track Channels)*—shows all 24 track channels in the lower area on the display.
    - *ID Mlt (Info Display Multiple Parameters)*—shows a detailed view of the currently selected group of 12 channel strips (Page 133).
    - *ID ChV (Info Display Channel View)*—shows the CH EDIT parameters for the currently selected input, track or FX return channel.

When the ID PL, ID IN or ID TR screens are in view, the meters strip is visible. You can change what's shown on the left side of the meters strip—the right side always shows the MONITOR and MASTER output levels:

1. Press HOME/DISPLAY.
2. Press PAGE until INPUT appears above F1.
3. Press:
    - *INPUT*—to meter the VS-2400CD's analog and digital input jacks and connectors.
    - *IN Mix*—to meter input channel levels.
    - *TR Mix*—to meter track channel levels.
    - *AUXDIR*—to meter the AUX and DIR bus levels.
    - *OUTPUT*—to meter the VS-2400CD's output levels.

Locking the Info Display

You can lock the currently displayed Info Display screen so that it stays in view as you move from screen to screen on the VS-2400CD itself.

1. Press HOME/DISPLAY.
2. Press PAGE until "IDHold" appears above the F6 button.
3. Press F6 (IDHold).
4. To unlock the display, repeat Steps 1-3.

When the LCD is Designated as the Info Display

The contents of the LCD Info Display can change to reflect what you're doing on the VGA main display. As with the VGA Info Display, you can access several important LCD screens—or lock the LCD—from the VS-2400CD's Home screen:

1. Press HOME•DISPLAY.
2. Press PAGE until "IDHome" appears above F1.
3. Press:
    - *F1 (IDHome)*—to view the VGA display's Home screen (Page 381).
    - *F2 (ID ChV)*—to view the CD EDIT parameters for the currently selected input, track or FX return channel (Page 146).
    - *IDWave*—to view the Wave Display for the currently selected track (Page 235).
    - *IDAnlr*—to view the Spectrum Analysis Display (Page 366).
    - *IDHold*—to lock the current contents of the LCD in place as you change screens on the VGA display.

30—VGA Main Display Universal Elements

This chapter describes the areas of the VGA main display that are always visible no matter how the rest of the display changes. These are the:

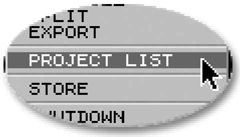
- menus
- PAN knob strip
- F buttons
- remaining space status strip
- control bar
- clipping indicators
- status strip

The illustration on Page 380 shows where these elements are located on the VGA.

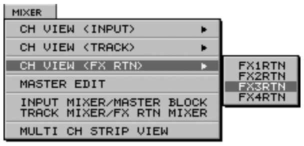
VGA Menus

The menus at the top of the VGA display give you quick mouse access to all of the features found in the VS-2400CD's onboard menus, and also contain items unique to the VGA main display. To select an item from a menu:

1. Click the desired menu with your mouse to display the menu's contents.
2. Move the cursor over the desired menu item to highlight it in blue and click the item with your mouse.



·LIT
EXPORT
PROJECT LIST
STORE
·UTDOWN

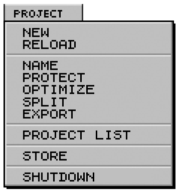


MIXER
CH VIEW <INPUT>
CH VIEW <TRACK>
CH VIEW <FX RTN>
MASTER EDIT
INPUT MIXER/MASTER BLOCK
TRACK MIXER/FX RTN MIXER
MULTI CH STRIP VIEW
FX1RTN
FX2RTN
FX3RTN
FX4RTN

An arrow to the right of a menu item signifies additional choices presented in a submenu. Hold you mouse cursor over the main menu item, drag rightward and down to select the desired item from the submenu and click your mouse.

To close a menu, click elsewhere on the screen or press EXIT/NO.

The PROJECT Menu



PROJECT
NEW
RELOAD
NAME
PROTECT
OPTIMIZE
SPLIT
EXPORT
PROJECT LIST
STORE
SHUTDOWN

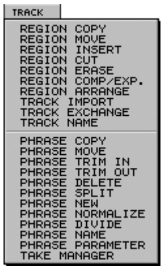
The PROJECT menu contains an assortment of options that relate to an entire project.

Menu item:	*See:*
NEW	Page 92
RELOAD	Page 386
NAME	Page 95
PROTECT	Page 95
OPTIMIZE	Page 96
SPLIT	Page 99
EXPORT	Page 105
PROJECT LIST	Page 89
STORE	Page 386
SHUTDOWN	Page 78

Two PROJECT menu items are found only in the VGA display's PROJECT menu:

- Select RELOAD to re-load the current project. This is a quick way get rid of any actions you've performed since you last loaded the project.
- Select STORE to save everything you've done to the current project since it was last saved or stored. This is the same thing as holding down SHIFT and pressing ZERO•STORE on the VS-2400CD itself, as described Page 89.

The TRACK Menu

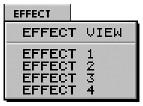

TRACK
REGION COPY
REGION MOVE
REGION INSERT
REGION CUT
REGION ERASE
REGION COMP/EXP.
REGION ARRANGE
TRACK IMPORT
TRACK EXCHANGE
TRACK NAME
PHRASE COPY
PHRASE MOVE
PHRASE TRIM IN
PHRASE TRIM OUT
PHRASE DELETE
PHRASE SPLIT
PHRASE NEW
PHRASE NORMALIZE
PHRASE DIVIDE
PHRASE NAME
PHRASE PARAMETER
TAKE MANAGER

The TRACK menu provides access to phrase, region, take and whole-track editing operations.

To learn more about what takes, phrases and tracks are, see Page 84. To learn about phrase and region editing, see Chapter 18.

Menu item:	*See:*
REGION COPY	Page 261
REGION MOVE	Page 263
REGION CUT	Page 264
REGION ERASE	Page 265
REGION COMP/EXP.	Page 265
REGION ARRANGE	Page 268
TRACK IMPORT	Page 267
TRACK EXCHANGE	Page 268
TRACK NAME	Page 270
PHRASE COPY	Page 251
PHRASE MOVE	Page 253
PHRASE TRIM IN	Page 253
PHRASE TRIM OUT	Page 254
PHRASE DELETE	Page 254
PHRASE SPLIT	Page 254
PHRASE NEW	Page 255
PHRASE NORMALIZE	Page 256
PHRASE DIVIDE	Page 256
PHRASE NAME	Page 257
PHRASE PARAMETER	Page 258
TAKE MANAGER	Page 259

The EFFECT Menu

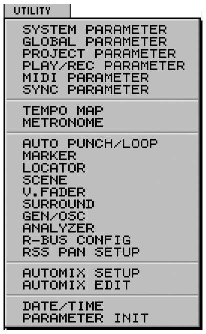

EFFECT
EFFECT VIEW
EFFECT 1
EFFECT 2
EFFECT 3
EFFECT 4

The EFFECT menu provides quick access to two types of effect screen:

- *EFFECT VIEW*—This screen presents a menu of your effect processors and provides basic information about each, as described on Page 214.
- *EFFECT 1-4*—display the Algorithm View screen for each processor (Page 215).

The EFFECT menu shows the available effect processors in your VS-2400CD, which depends on how many VS8F-2 effect expansion boards are installed. When the VS-2400CD is shipped from the factory, Effects 1 and 2 are available—with another optional board installed, all four effect processors are available.

The UTILITY Menu

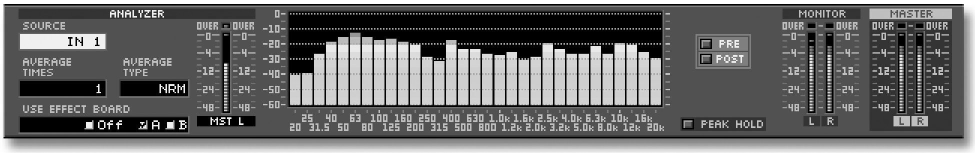

UTILITY
SYSTEM PARAMETER
GLOBAL PARAMETER
PROJECT PARAMETER
PLAY/REC PARAMETER
MIDI PARAMETER
SYNC PARAMETER
TEMPO MAP
METRONOME
AUTO PUNCH/LOOP
MARKER
LOCATOR
SCENE
V.FADER
SURROUND
GEN/OSC
ANALYZER
R-BUS CONFIG
RSS PAN SETUP
AUTOMIX SETUP
AUTOMIX EDIT
DATE/TIME
PARAMETER INIT

This menu provides access to the many parameters and features of the VS-2400CD's onboard UTILITY menu. The first six menu items display groups of UTILITY menu parameter pages.

Menu item:	*See:*
SYSTEM PARAMETER	Page 352
GLOBAL PARAMETER	Page 354
PROJECT PARAMETER	Page 357
PLAY/REC PARAMETER	Page 358
MIDI PARAMETER	Page 285
SYNC PARAMETER	Page 296
TEMPO MAP	Page 295, Page 298
METRONOME	Page 361
AUTO PUNCH/LOOP	Page 187, Page 175
MARKER	Page 184
LOCATOR	Page 180
SCENE	Page 141
V.FADER	Page 286
SURROUND	Page 309
GEN/OSC	Page 364
ANALYZER	Page 387
R-BUS CONFIG	Page 369
RSS PAN SETUP	Page 220
AUTOMIX SETUP	Page 314
AUTOMIX EDIT	Page 320
DATE/TIME	Page 65
PARAMETER INIT	Page 368

The Analyzer

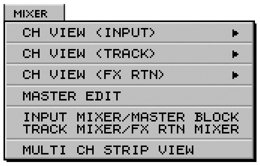
When you select ANALYZER from the UTILITY menu, the VS-2400CD's spectrum analyzer replaces the left side of the VGA's meters strip. The analyzer features the same parameters as those found on the internal LCD's ANALYZER screen (Page 366), and is operated the same way.


SOURCE: IN 1
AVERAGE TIMES: 1
AVERAGE TYPE: NRM
USE EFFECT BOARD: ☐ Off ☑ A ☐ B
ANALYZER
OVER
0
-4
-12
-24
-48
MST L
0
-10
-20
-30
-40
-50
-60
25 40 63 100 160 250 400 630 1.0k 1.6k 2.5k 4.0k 6.3k 10k 16k
20 31.5 50 80 125 200 315 500 800 1.2k 2.0k 3.2k 5.0k 8.0k 12k 20k
☐ PRE
☐ POST
☐ PEAK HOLD
MONITOR
L R
MASTER
L R

If you'd like to keep the spectrum analyzer in view as you work on the VGA, you can display it on the VS-2400CD's LCD, locking it in place. See "When the VGA is Designated as the Info Display" on Page 382.

When you perform a PROJECT menu operation, load a scene or EZ Routing template, or change an effect patch via MIDI or using Automix, the analyzer's USE EFFECT BOARD parameter is automatically turned off.

MIXER Menu

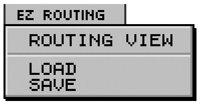

MIXER
CH VIEW <INPUT> ▸
CH VIEW <TRACK> ▸
CH VIEW <FX RTN> ▸
MASTER EDIT
INPUT MIXER/MASTER BLOCK
TRACK MIXER/FX RTN MIXER
MULTI CH STRIP VIEW

The MIXER menu allows you to display any of the VS-2400CD's 52 mixer channels. You can do so in a variety of ways. To view:

- all of the parameters of a single:
  - *input channel*—select it from the CH VIEW (INPUT) submenu.
  - *track channel*—select it from the CH VIEW (TRACK) submenu.
  - *FX return channel*—select it from the CH VIEW (FX RTN) submenu.
- *the Aux and Direct path configuration parameters*—select MASTER EDIT.
- *all of the input channels and MASTER EDIT parameters*—select INPUT MIXER/ MASTER BLOCK.
- *all of the track channels and FX returns*—select TRACK MIXER/FX RTN MIXER.
- *a detailed view of the currently selected set of channels*—select MULTI CH STRIP VIEW.

For more information regarding the MIXER menu views, see Chapter 33, starting on Page 419.

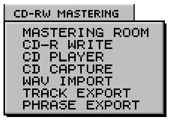
EZROUTING Menu


EZ ROUTING
ROUTING VIEW
LOAD
SAVE

In the EZ ROUTING menu, select:

- *ROUTING VIEW*—to display the EZ ROUTING VIEW screen in which you can route signals by dragging the desired connectors with your mouse. You can also turn phantom power on and off and activate digital inputs. This screen is described in detail in Chapter 34 starting on Page 435.
- *LOAD*—to display the EZ ROUTING TEMPLATE LOAD screen, described on Page 283.
- *SAVE*—to display the EZ ROUTING TEMPLATE SAVE screen, described on Page 282.

CD-RW MASTERING Menu

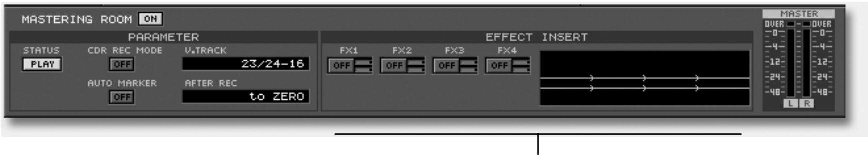

CD-RW MASTERING
MASTERING ROOM
CD-R WRITE
CD PLAYER
CD CAPTURE
WAV IMPORT
TRACK EXPORT
PHRASE EXPORT

The CD-RW MASTERING menu provides access to the operations associated with the VS-2400CD's CD-RW/MASTERING button.

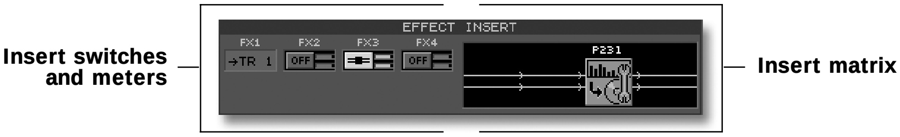
Menu item:	*See:*
MASTERING ROOM	*(See below)*
CD-R WRITE	Page 340
CD PLAYER	Page 343
CD CAPTURE	Page 348
WAVE IMPORT	Page 344
TRACK EXPORT	Page 346
PHRASE EXPORT	Page 346

The Mastering Room

When you select MASTERING ROOM from the CD-RWMASTERING menu, the Mastering Room (Page 333) replaces the meters strip.


MASTERING ROOM ON
PARAMETER
STATUS
PLAY
CDR REC MODE
OFF
V.TRACK
23/24-16
AUTO MARKER
OFF
AFTER REC
to ZERO
EFFECT INSERT
FX1
FX2
FX3
FX4
OFF
MASTER
OVER
L
R
EFFECT INSERT controls

Use the EFFECT INSERT matrix to insert effects on the MASTER bus.


Insert switches and meters
EFFECT INSERT
FX1
FX2
FX3
FX4
→TR 1
OFF
P231
Insert matrix

In this illustration:
- **FX 1 is already inserted on Input Channel 1, as its switch shows.**
- **We've inserted Effect 3 and selected a Mastering Tool Kit effect patch.**

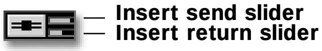
To activate an insert effect:

1. Click its switch so that it turns yellow and a blue box showing its currently selected effect patch appears in the insert matrix. The matrix shows how signal flows from one inserted effect processor to the next.

You'll want to use one of the Mastering Tool Kit (MTK) effect patches. Select an odd-numbered processor since each powerful MTK patch requires an odd-numbered processor as well as its even-numbered partner.

If a processor is unavailable because it's already in use as an insert effect elsewhere, its switch shows the name of the channel on which it's inserted, as shown above.

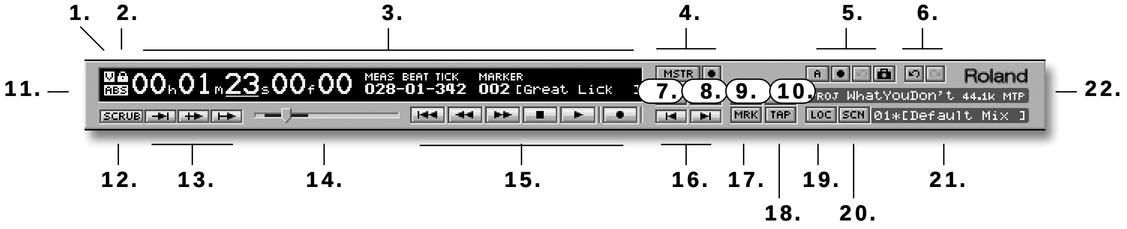
If even-numbered processor is being used by an MTK effect, it can't be selected a separate insert effect.


Insert send slider
Insert return slider

- *To adjust the send to or return from an insert effect*—drag its blue insert send or return slider, respectively, up or down to set the send or return level as desired.
- *To select a new effect patch or edit the current patch*—click on the effect's blue box in the matrix to display the processor's Algorithm View screen (Page 215).

VGA Control Bar

The VGA main display's control bar provides a wide assortment of important tools.


1.
2.
3.
4.
5.
6.
11.
22.
00h01m23s00f00
MEAS BEAT TICK
028-01-342
MARKER
002 [Great Lick
MSTR
7.
8.
9.
10.
Roland
ROJ WhatYouDon't 44.1k MTP
SCRUB
MRK
TAP
LOC
SCN
01*[Default Mix]
12.
13.
14.
15.
16.
17.
19.
21.
18.
20.

1. VARI PITCH indicator
2. Write-protect indicator
3. Current Time Location display
4. Mastering Controls
5. Automix controls
6. UNDO/REDO
7. EXT SYNC
8. Metronome
9. A.PUNCH
10. LOOP
11. ABS/REL Indicator
12. SCRUB
13. PREVIEW buttons
14. Position bar
15. Transport buttons
16. PREVIOUS/NEXT
17. MARKER
18. TAP
19. LOCATOR (LOC)
20. SCENE (SCN
21. Scene name/number
22. Project information

1. VARI PITCH Indicator

When the VARI PITCH parameter is turned on, the VARI PITCH indicator lights.

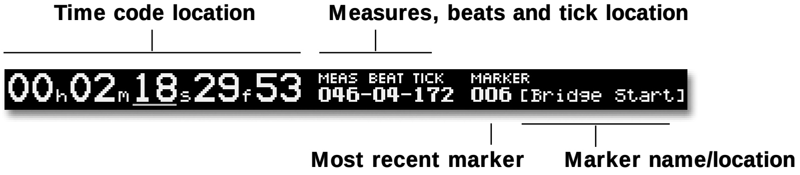
176

2. Write-Protect Indicator

When the current project is write-protected, the Write-Protect indicator lights.

95

3. Current Time Location Display

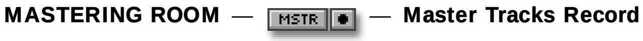

Time code location
Measures, beats and tick location
00h02m18s29f53
MEAS BEAT TICK
046-04-172
MARKER
006 [Bridge Start]
Most recent marker
Marker name/location

The Current Time Location display shows the current position of the now line in time code—hours/minutes/seconds/frames/subframes—and in measures, beats and ticks. It also shows the most recent marker and the marker's name or—if it hasn't been named—its time location.

122

You can navigate a project using the Current Time Location display, as described on Page 122.

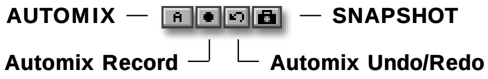
4. Mastering Controls


MASTERING ROOM —
MSTR
— Master Tracks Record

Click MASTERING ROOM to turn the Mastering Room on or off. When it's on, click Master Tracks Record to start recording mastering tracks.

333

5. Automix Controls

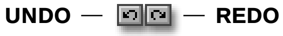


Click:

- *AUTOMIX*—to turn the Automix feature on or off.
- *Automix Record*—to start or stop recording Automix data.
- *SNAPSHOT*—to take a snapshot of your mixer settings at the now line's current mixer location.
- *Automix Undo/Redo*—to undo or redo your most recent Automix action.

313

6. UNDO/REDO



Click UNDO to reverse your last recording or editing action. If the REDO light on the VS-2400CD is lit, click REDO to restore your latest undone action.

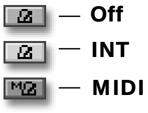
70

7. EXT SYNC

Click EXT SYNC so it lights to synchronize the VS-2400CD to an external device according to the current UTILITY menu Sync parameter settings.

293

8. Metronome



Click the Metronome button to turn the VS-2400CD's metronome on or off by changing the setting of the METRONOME OUT parameter. The parameter can be set to Off, INT (yellow) or MIDI (blue).

361

9. A.PUNCH

Click A.PUNCH to display the AUTO PUNCH/LOOP window in which you can set punch in and -out points. If punch points have been set, click this button turn on the VS-2400CD's Auto Punch feature.

186

Punch-in and -out points appear above the Home screen's playlist as red arrows. When Auto Punch is turned on, a red bar connects the two points. See Page 404.

10. LOOP

Click LOOP to display the AUTO PUNCH/LOOP window in which you can set loop start and end points. If the loop points have been set, click this button to turn on looped playback of the VS-2400CD's hard disk recorder.

174

Loop start and end points appear above the Home screen's playlist as blue arrows. When looping is turned on, a blue loop box connects the two points. See Page 404.

11. ABS/REL Indicator

The Current Time Location display can show absolute project time (ABS), or can shift the time to correspond to an external device to which the VS-2400CD is being synchronized (REL).

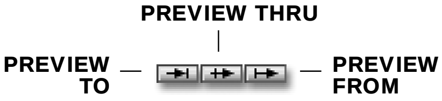
303

12. SCRUB

Click SCRUB to repeatedly audition a tiny fragment of audio at the now line's current location in order to pinpoint a recorded event.

178

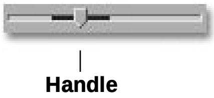
13. PREVIEW Buttons



When you're trying to locate the precise time at which an audio event occurs, click the appropriate PREVIEW button to listen to audio just before and/or after the current position of the now line.

177

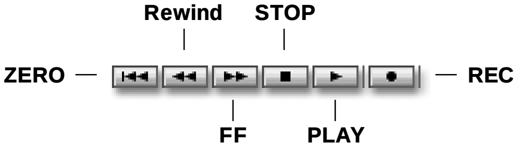
14. Position Bar



Click and drag the position bar's handle to move to any location in a project. The position of the handle shows you where you are in a project.

118

15. Transport Buttons



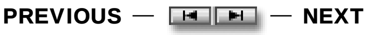
Rewind and FF can move the now line in increments as small as one second.

Click:

- *ZERO*—to return the now line to the start of the project.
- *Rewind*—to move the now line quickly back through the project.
- *FF*—to move the now line quickly forward through the project.
- *STOP*—to halt playback of the project.
- *PLAY*—to begin playback from the now line's current location.
- *REC*—to begin recording.

171

16. PREVIOUS/NEXT



Click PREVIOUS or NEXT to move the now line backward to the most recent phrase or marker, or forward to the next one, respectively.

183

17. MARKER (MRK)

MRK

Click MARKER to display the Locate to Marker window when you want to move the now line to the desired marker, or want to clear a marker.

182

Your project must contain at least one marker before you open the Locate to Marker window.

18. TAP

TAP

Click TAP to place a new marker at the now line's current position.

182

19. LOCATOR (LOC)

LOC

Click LOCATOR to open the LOCATE window in which you can name, clear, create, move or jump to locators.

180

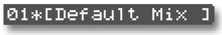
20. SCENE (SCN)

SCN

Click SCENE to open the SCENE window in which you can name, store, recall and configure scenes.

141

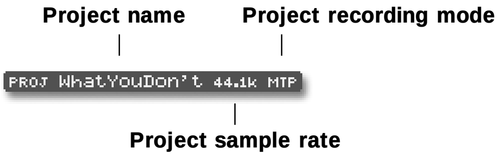
21. Scene Name/Number


01*[Default Mix]

This display shows the number—and if it's been named—the name of the last-recalled scene.

141

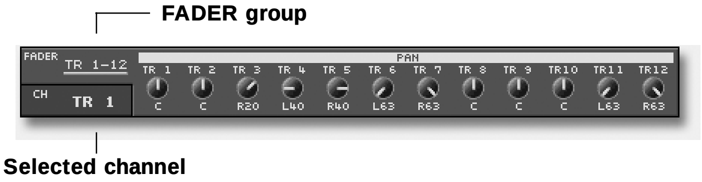
22. Project Information


Project name
Project recording mode
PROJ WhatYouDon't 44.1k MTP
Project sample rate

This readout shows the name of the current project, its sample rate and its recording mode.

92, 93

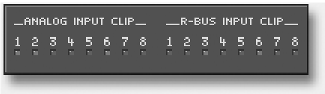
PAN Knob Strip


FADER group
FADER
TR 1-12
CH
TR 1
PAN
TR 1
TR 2
TR 3
TR 4
TR 5
TR 6
TR 7
TR 8
TR 9
TR10
TR11
TR12
C
C
R20
L40
R40
L63
R63
C
C
C
L63
R63
Selected channel

The PAN knob strip allows you to adjust the PAN parameter for the group of channels shown at the upper left of the strip. The currently selected channel is at the bottom left.

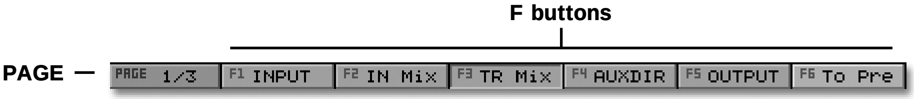
To "turn" a knob, click and drag it up or down to raise or lower, respectively, its setting.

The VGA Input Clipping Indicators


ANALOG INPUT CLIP
1 2 3 4 5 6 7 8
R-BUS INPUT CLIP
1 2 3 4 5 6 7 8

The VGA main display's input clipping indicators light when an input channel's analog input signal is too loud. The INPUT PEAK LEVEL parameter sets the level at which they light—see Page 354.

VGA F Buttons


F buttons
PAGE
PAGE 1/3
F1 INPUT
F2 IN Mix
F3 TR Mix
F4 AUXDIR
F5 OUTPUT
F6 To Pre

The F buttons beneath the VGA main display's content pane (Page 380) mirror the current behavior of the F buttons beneath the VS-2400CD's internal LCD, as does its PAGE button. You can click the VGA's F buttons or the LCD's at any time with the same results.

66, 67

PAGE shows the number of screens associated with the current display.

You can move from page to page by pressing ▼ and ▲.

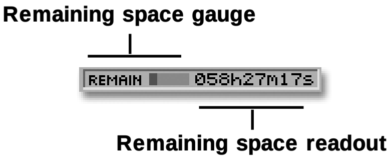
If you prefer, press F1-F6 on a connected ASCII keyboard instead of clicking with your mouse or pressing the VS-2400CD's physical F buttons. Use Tab as your PAGE button.

Status Strip

The status strip contains flashing indicators that signal the activation of certain features and modes that might not otherwise be visually obvious.

When:	*The status display flashes:*
one or more channels are soloed	"SOLO" in blue
one or more channels are muted	"MUTE" in yellow
Mastering Room playback is turned on	"MASTERING PLAY" in green
Mastering Room recording is turned on	"MASTERING REC" in red
Automix recording is turned on	"AUTOMIX REC" in red

VGA Remaining Space Status Strip


Remaining space gauge
REMAIN
058h27m17s
Remaining space readout

The VGA Remaining Space strip shows you how much free hard disk space remains on your internal hard drive. The gauge graphically shows the remaining space in bright green. You can select how the readout shows the amount of free space left by setting the REMAIN DISPLAY TYPE parameter.

357

31—VGA Main Display Home Screen

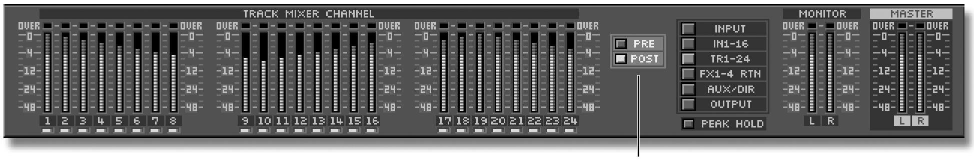
The VGA main display's Home screen provides the basic starting point for VGA-based VS-2400CD operations. In addition to the universal elements described in the previous chapter, the Home screen contains a selected set of meters that allow you to keep an eye on various volume levels, and a project playlist in which you can perform a variety of tasks, including the editing of track phrases and regions. This chapter describes how the meters strip and the playlist areas work.

As we mentioned earlier, you can display the VGA Home screen in any of three ways:

- click the HOME button in the upper right-hand corner of the VGA display.
- press the HOME•DISPLAY button on the VS-2400CD.
- press the Home key on a connected ACSII keyboard.

The Meters Strip

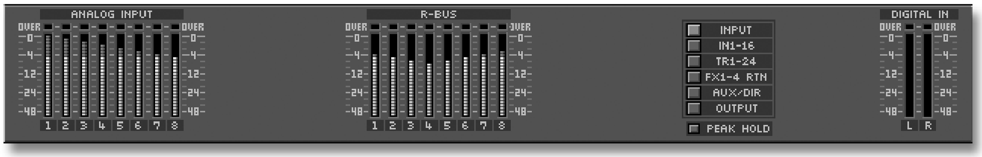
Meters strip control buttons


TRACK MIXER CHANNEL
PRE
POST
INPUT
IN1-16
TR1-24
FX1-4 RTN
AUX/DIR
OUTPUT
PEAK HOLD
MONITOR
MASTER
L
R

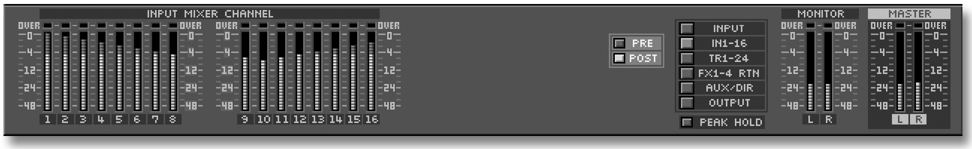
PRE/POST buttons

The VGA main display meters strip provides a variety of meters that allow you to view:

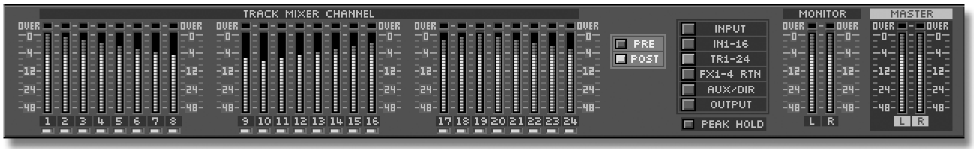
- *input levels*—signals coming into the VS-2400CD's input jacks and connectors.


ANALOG INPUT
R-BUS
DIGITAL IN
INPUT
IN1-16
TR1-24
FX1-4 RTN
AUX/DIR
OUTPUT
PEAK HOLD
L
R

- *input channel levels*—signals as they come into or exit the 16 input channels.

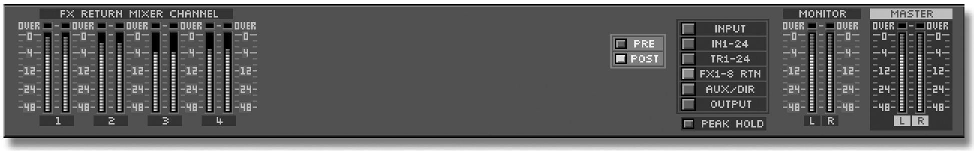

INPUT MIXER CHANNEL
PRE
POST
INPUT
IN1-16
TR1-24
FX1-4 RTN
AUX/DIR
OUTPUT
PEAK HOLD
MONITOR
MASTER
L
R

- *track channel levels*—signals as they come into or exit the 24 track channels.

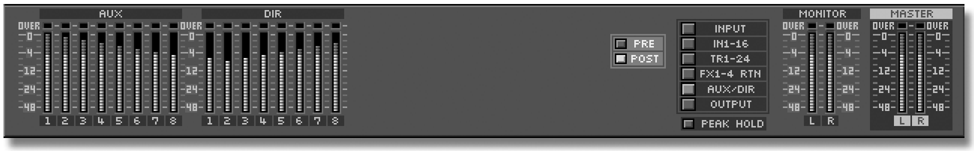

TRACK MIXER CHANNEL
PRE
POST
INPUT
IN1-16
TR1-24
FX1-4 RTN
AUX/DIR
OUTPUT
PEAK HOLD
MONITOR
MASTER
L
R

TRACK STATUS buttons—*see below*

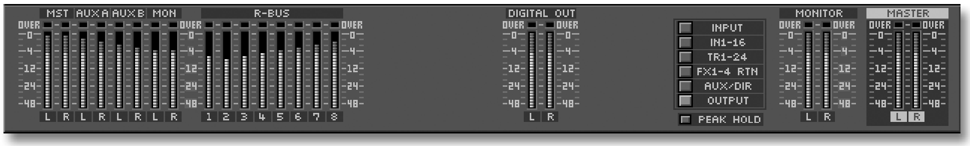
- *fx return channel levels*—signals as they exit the VS-2400CD's internal effect processors.


FX RETURN MIXER CHANNEL
OVER
0
4
12
24
48
1
2
3
4
PRE
POST
INPUT
IN1-24
TR1-24
FX1-8 RTN
AUX/DIR
OUTPUT
PEAK HOLD
MONITOR
MASTER
L
R

- *Aux and Direct path levels*—the eight Aux and eight Direct paths.

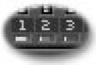

AUX
DIR
OVER
1 2 3 4 5 6 7 8
1 2 3 4 5 6 7 8
PRE
POST
INPUT
IN1-16
TR1-24
FX1-4 RTN
AUX/DIR
OUTPUT
PEAK HOLD
MONITOR
MASTER
L
R

- *output levels*—signals as they exit the VS-2400CD's output jacks and connectors.


MST
AUX A
AUX B
MON
R-BUS
DIGITAL OUT
OVER
L R L R L R L R
1 2 3 4 5 6 7 8
INPUT
IN1-16
TR1-24
FX1-4 RTN
AUX/DIR
OUTPUT
PEAK HOLD
MONITOR
MASTER
L
R

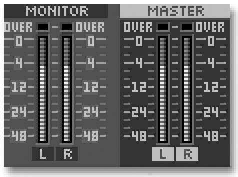
The number of active FX return channels depends on how many VS8F-2 effect expansion boards are installed in your VS-2400CD. See Page 54.

Track Channel Meters TRACK STATUS Buttons



You can click the small button beneath a track channel meter to set the corresponding hard disk recorder track's status—the button acts just like a TRACK STATUS button on the VS-2400CD, described on Page 172.

The MONITOR and MASTER Meters

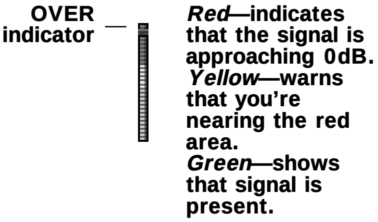

MONITOR
MASTER
OVER
0
4
12
24
48
L
R

The stereo MONITOR and MASTER bus output levels are displayed at the right of the meters strip except when the input meters are visible.

Working with the Meters Strip

Reading a Meter

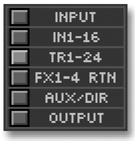
Each meter in the meter strip contains a vertical stack of segments that light to show the corresponding signal's level—the higher the stack, the louder the signal. The segments are color-coded to help you see at a glance how loud your signal is. If a signal exceeds 0dB, the meter's OVER indicator lights to show you that the signal's too loud.


OVER indicator
Red—indicates that the signal is approaching 0dB.
Yellow—warns that you're nearing the red area.
Green—shows that signal is present.

Selecting the Desired Meters

The strip provides a set of meters for each of the signal types listed above. You can select the meters you want to display in either of two ways. You can use the:

- *meters strip control buttons*—Click:
  - *INPUT*—to display input signal levels.
  - *IN 1-16*—to display input channel levels.
  - *TR 1-24*—to display track channel levels.
  - *FX1-4 RTN*—to display internal effect return levels.
  - *AUX/DIR*—to display Aux bus and Direct path levels.
  - *OUTPUT*—to display output levels.
- *PAGE and F buttons on the VGA or on the VS-2400CD*—Press PAGE until "INPUT" appears above F1 and press:
  - *INPUT*—to display input signal levels.
  - *IN MIX*—to display input channel levels
  - *TR MIX*—to display track channel levels
  - *AUXDIR*—to display Aux bus and Direct path levels.
  - *OUTPUT*—to display output levels.



The TR 1-24 button is red to indicate that the track channel meters are being displayed.

To display FX return levels using the F buttons, press PAGE until "FX RTN" appears above F5 and then press F5 (FX RTN).

The meters strip on the VGA operates in much the same way as the LCD meters strip. See Page 120 for additional info.

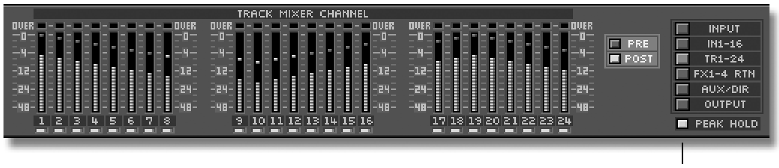
Pre and Post

You can select pre or post metering when you're viewing anything other than input and output signals. (To learn about pre and post metering, see the note on Page 117.)

Select the desired type of metering by:

- clicking the meters strip's PRE or POST button.
- use the PAGE and F buttons on the VGA or VS-2400CD:
  1. Press PAGE until "INPUT" appears above F1.
  2. Click or press:
     - *F6 (To Pre)*—to select pre metering.
     - *F6 (To Pst)*—to select post metering.

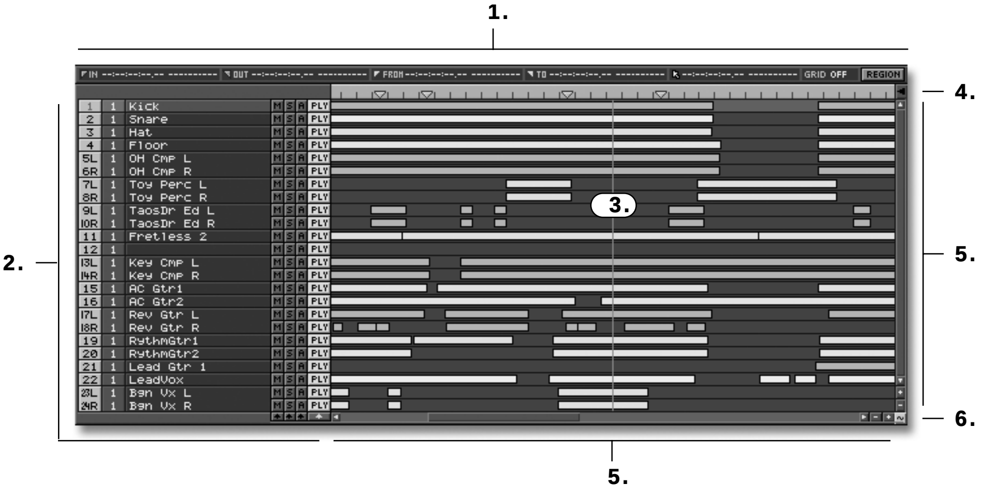
The PEAK HOLD Button



PEAK HOLD button

Click the PEAK HOLD button so that it lights yellow to make your signals' loudest levels "stick" in their meters until you release them. The Peak Hold feature helps ensure that you don't miss any unexpected level peaks should you look away from the meters. To "un-stick" the meters, click the PEAK HOLD button again to unlight it.

The Playlist Area


1.
2.
3.
4.
5.
5.
6.
GRID OFF
REGION
Kick
Snare
Hat
Floor
OH Cmp L
OH Cmp R
Toy Perc L
Toy Perc R
TaosDr Ed L
TaosDr Ed R
Fretless 2
Key Cmp L
Key Cmp R
AC Gtr1
AC Gtr2
Rev Gtr L
Rev Gtr R
RythmGtr1
RythmGtr2
Lead Gtr 1
LeadVox
Bgn Vx L
Bgn Vx R
M S A PLY

1.	**Edit control strip**	**4.**	**Playlist control panel switch**
2.	**Track controls**	**5.**	**Navigation and zoom buttons**
3.	**Now line**	**6.**	**WAVE DISPLAY button**

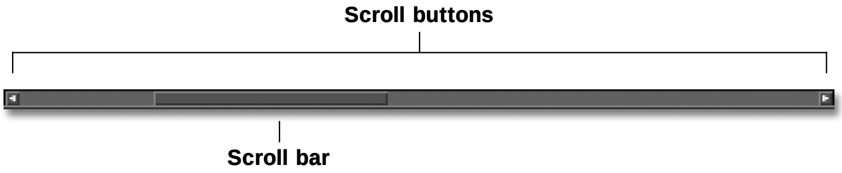
The VGA's Home screen contains a project playlist that performs the same tasks as the internal LCD's playlist, and more. You can view your project's tracks, navigate the project, place markers and edit track audio with your mouse in the VGA playlist. In addition, you can mute and solo any track, set its Automix status, and adjust important track channel CH EDIT parameters. You can also select V-Tracks and store and recall locators and scenes right from the playlist.

To learn about:	*See:*
the project playlist	Page 118
markers	Page 182
editing track audio	Page 231
Automix	Page 313
CH EDIT parameters	Page 145
locators	Page 179
scenes	Page 139

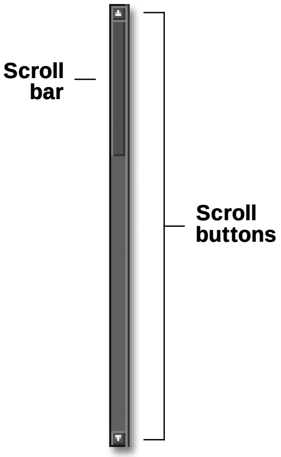
Operating the VGA Playlist

Getting Around

You can move through a project using the VGA playlist's horizontal scroll bar and buttons, located at the bottom edge of the playlist.


Scroll buttons
Scroll bar

To move quickly through the project, drag the scroll bar in the desired direction—the size of the scroll bar indicates how much of the project is currently visible. To move backward by small increments, click the left scroll button. To move slowly forward, click the right scroll button.



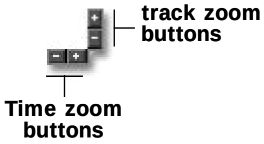
You can also use the VS-2400CD's standard navigation tools—the Time/Value dial and current time location display as well as locators, markers, and so on. (Project markers are shown as gold downward-pointing triangles above the tracks in the playlist, as shown on Page 404.)

Use the playlist's vertical scroll bar and buttons along its righthand edge to move up or down through the project's tracks. To move quickly to a different set of tracks, drag the scroll bar in the desired direction—the size of the scroll bar indicates how many of the project's tracks are currently visible. To move by smaller increments up or down through the tracks, click the desired vertical scroll button.

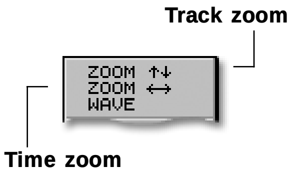
Zooming

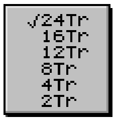
The VGA playlist's zoom buttons allow you to increase or decrease the magnification of the project's tracks. The:

- *time zoom buttons*—determine how much of the project is displayed. Zoom in to view a smaller area more closely, or out to view more of the project.
- *track zoom buttons*—determine how many tracks are displayed. To show fewer tracks in greater detail, zoom in. To show more tracks, zoom out.

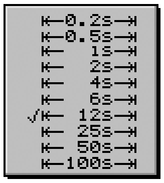


Another way to zoom is to right-click on the playlist and select the desired ZOOM item from the Edit Pop-Up menu (Page 238). When you do, a window appears in which you can select the desired magnification.





Track zoom



Time zoom

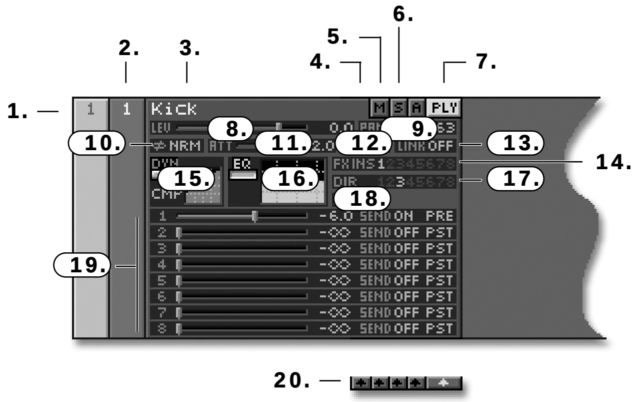
You can also zoom in or out by holding down SHIFT and using the ◀ , ▶ , ▲ or ▼ buttons on the VS-2400CD, as described on Page 119.

As you zoom in with the track zoom buttons, more onscreen space is available for each track. As a result:

- additional track controls appear as space allows.
- when you zoom in so that only four or two tracks are visible, the VGA shows each phrase's waveform for editing purposes.

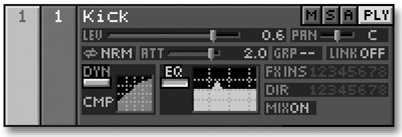
The VS-2400CD generates editing waveforms when its transport is stopped—as a project plays, these waveforms move across the now line. When the transport stops again, the VS-2400CD refreshes the playlist with new editing waveforms as necessary.

VGA Playlist Track Controls

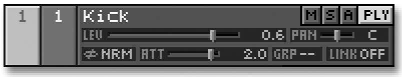

1.
2.
3.
4.
5.
6.
7.
8.
9.
10.
11.
12.
13.
14.
15.
16.
17.
18.
19.
20.
Kick
M S A PLY
LEV
PAN
NRM
ATT
LINK OFF
DYN
CMP
EQ
FX INS
DIR
SEND ON PRE
SEND OFF PST

1. **Track number/CH VIEW button**
2. **V-Track selector**
3. **Track name**
4. **MUTE button**
5. **SOLO button**
6. **AUTOMIX STATUS button**
7. **TRACK STATUS button**
8. **FADER slider**
9. **PAN slider**
10. **PHASE button**
11. **ATT slider**
12. **GROUP selector**
13. **LINK switch**
14. **FX Ins selector**
15. **DYNAMICS switch**
16. **EQ switch**
17. **DIR 1-8 selector**
18. **MIX button**
19. **Aux send controls**
20. **Status toggles**

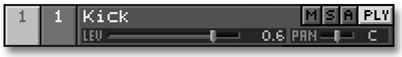
Each track in the playlist contains a track control area in which you can access the corresponding track channel's important CH EDIT parameters without leaving the playlist. This makes it easy to quickly perform mix-related adjustments as you work with track audio. As you zoom in on the tracks—see Page 399—the number of available controls changes as space allows. The illustration above shows the controls that are available when you're zoomed in to a two-track view).


Kick
M S A PLY
LEV 0.6 PAN C
NRM ATT 2.0 GRP-- LINK OFF
DYN
CMP
EQ
FX INS
DIR
MIX ON

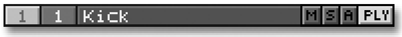
With four tracks displayed


Kick
M S A PLY
LEV 0.6 PAN C
NRM ATT 2.0 GRP-- LINK OFF

With eight tracks displayed


Kick
M S A PLY
LEV 0.6 PAN C

With 12 tracks displayed


Kick
M S A PLY

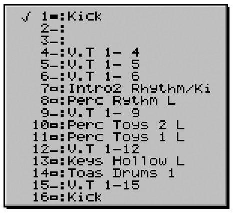
With 16 or 24 tracks displayed

Most of the track controls are VGA versions of the standard CH EDIT track channel parameters described in Chapter 11—a few parameters have been combined to save onscreen space. Each track's TRACK STATUS and AUTOMIX STATUS and buttons can also be found among the track controls.

1. Track Number/CH VIEW Button

You can click the track's number to display its CH VIEW screen—see Page 409.

2. V-Track Selector



```
√  1■:Kick
   2-:
   3-:
   4-:V.T 1- 4
   5-:V.T 1- 5
   6-:V.T 1- 6
   7▭:Intro2 Rhythm/Ki
   8▭:Perc Rythm L
   9-:V.T 1- 9
  10▭:Perc Toys 2 L
  11▭:Perc Toys 1 L
  12-:V.T 1-12
  13▭:Keys Hollow L
  14▭:Toas Drums 1
  15-:V.T 1-15
  16▭:Kick
```

The currently selected V-Track is checkmarked.

The V-Track selector performs the same job as the CH EDIT V-Trk parameter. It shows the number of the track's currently active V-Track—click on the number to display a pop-up menu from which you can select a different V-Track. The menu shows each V-Track's name and indicates with symbols the presence or absence of recorded data on each V-Track, and shows whether the V-Track is currently selected.

■ — **Selected, contains audio**
▬ — **Selected, contains no audio**
_ — **Contains no audio, not selected**
▭ — **Contains audio, not selected**

An asterisk to its right indicates that a V-Track uses the CD-R recording mode.

To learn about V-Tracks, see Page 84.

3. Track Name

4. MUTE (M) Button

M

Click MUTE—so that it turns yellow—to silence the track's audio. To un-mute the track, click MUTE again.

138

You can quickly un-mute all of your muted tracks by clicking the Mute status toggle button. See Page 404.

5. SOLO (S) Button

S

Click SOLO so that it turns blue to isolate the track by silencing all un-soloed tracks. To un-solo the track, click SOLO again.

138

You can quickly un-solo all of your soloed tracks by clicking the Solo status toggle button. See Page 404.

6. AUTOMIX STATUS (A) Button

A

When Automix is turned on, you can set the status of the track's corresponding Automix track by repeatedly clicking the AUTOMIX STATUS button.

316

You can simultaneously set the Automix status of all of your Automix tracks by repeatedly clicking the Automix status toggle button. See Page 404.

7. TRACK STATUS Button

PLY

Click a TRACK STATUS button repeatedly to set its track's status—this is the same as pressing the corresponding physical TRACK STATUS button on the VS-2400CD.

172

8. FADER (LEV) Slider

Drag the FADER slider to set the track channel's CH EDIT FADER parameter—this serves the same purpose as moving the channel's physical fader. The readout to the right of the slider shows the track channel's output level in dB.

150

9. PAN Slider

Adjust the track channel's stereo position by dragging the PAN slider as desired—the current pan position is shown to the right of the slider. When you move the slider, you're adjusting the track channel's CH EDIT PAN parameter value.

152

10. PHASE Button

Click "NRM" or INV" in the PHASE button to reverse the phase polarity of the track channel's signal.

150

11. ATT Slider

Set the ATT slider to adjust the level of the signal coming from the hard disk recorder into the track channel. The signal's level is shown to the right of the slider.

148

12. GROUP (GRP) Selector

To assign the track channel to a fader group, click to the right of "GRP" and select the desired fader group from the pop-up menu.

150

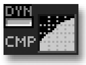
13. LINK Switch

LINK combines the CH EDIT ChLink and F.LINK parameters. Click to the right of "LINK" and select the desired type of linking from the pop-up menu or turn off linking.

147, 151

14. FX Ins Selector

15. DYNAMICS (DYN) Switch and Overview

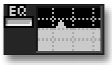


Turn on the track channel's dynamics processor by clicking the DYN switch. The current dynamics shape is shown graphically next to the switch—when the switch is on, the shape becomes blue.

149

You set up a channel's dynamics processing by drawing the desired shape with your mouse in the CH VIEW screen as described on Page 415.

16. EQ Switch and Overview

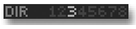


Turn on the track channel’s EQ by clicking the EQ switch. The current EQ curve appears to the right of the switch—when the switch is on, the curve turns blue.

149

You can set up a channel’s EQ by drawing the desired curve with your mouse in the CH VIEW screen, as described on Page 415.

17. DIR (DIRECT) 1-8 Selector



To assign the track channel to a Direct path, click the desired Direct path’s number so it lights.

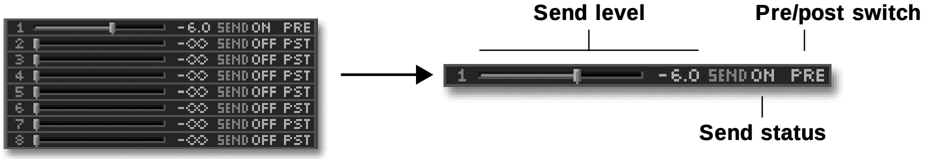
151

18. MIX Button

Turn MIX on to send the track channel’s signal into the MASTER bus, the main stereo mix. Turn it off to remove it from the mix.

149

19. AUX Send Controls


1 -6.0 SEND ON PRE
2 -∞ SEND OFF PST
3 -∞ SEND OFF PST
4 -∞ SEND OFF PST
5 -∞ SEND OFF PST
6 -∞ SEND OFF PST
7 -∞ SEND OFF PST
8 -∞ SEND OFF PST

1 -6.0 SEND ON PRE

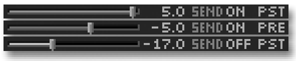
The AUX send controls include the following parameters:

- *Send level*—drag a slider to set the track channel’s Aux send level to the corresponding Aux bus (See Page 148). The send level appears to the right of the slider in dB. When Aux busses are linked, the even-numbered bus’s send control is replaced by a panning handle, described on Page 423.
- *Send status*—turns the Aux send to each bus on or off. See Page 148.
- *Pre/post switch*—sets the pre or post configuration of each Aux bus. See Page 81.

When you change an Aux bus’s pre/post setting, you’re setting the pre/post configuration of the Aux bus for any channel that’s using it, as described on Page 148.

The color of each Aux bus’s slider provides helpful information at a glance. When a slider’s:

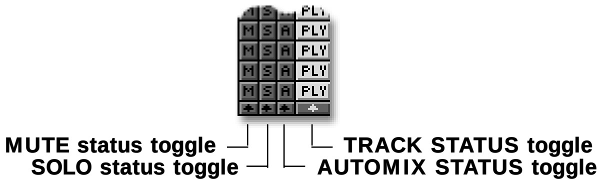
- *blue*—the send is turned on and the bus is set to Post.
- *red*—the send is turned on and the bus is set to Pre.
- *gray*—the send is turned off.


5.0 SEND ON PST
-5.0 SEND ON PRE
-17.0 SEND OFF PST

When odd/even Aux busses are linked, the even-numbered bus’s slider is replaced by a panning handle, as described on Page 423.

20. Status Toggles

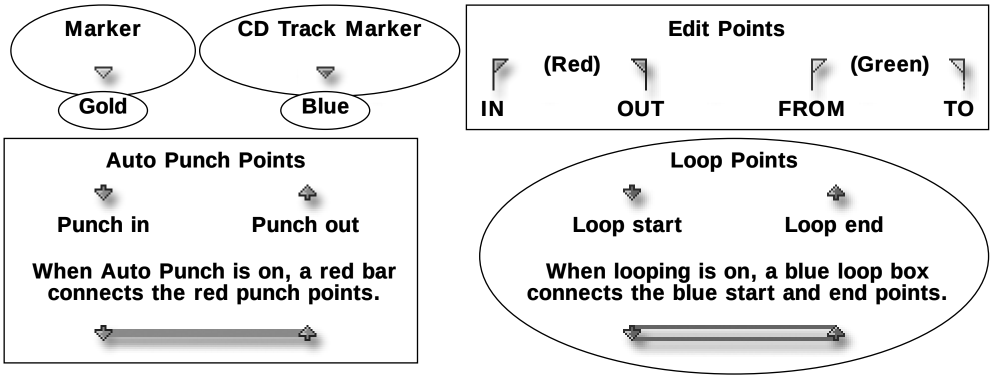
Beneath the track control areas are five status toggle buttons. You can click each button to toggle the setting of the entire column of buttons directly above it.


M S A PLY
MUTE status toggle
SOLO status toggle
TRACK STATUS toggle
AUTOMIX STATUS toggle

Click this status toggle:	*To:*
MUTE	un-mute all currently muted tracks.
SOLO	un-solo all currently soloed tracks.
AUTOMIX STATUS	set the status of all Automix tracks to the same value.
TRACK STATUS	set the TRACK STATUS of all tracks to the same value.

The Playlist's Measure Bar

Just above the playlist is a gray strip called the "measure bar." The lines in the bar show the project measures as defined by the project tempo map (Page 298). The time bar also contains markers, CD track markers, edit point flags, punch points and loop points.


Marker
Gold
CD Track Marker
Blue
Edit Points
(Red)
IN
OUT
(Green)
FROM
TO
Auto Punch Points
Punch in
Punch out
Loop Points
Loop start
Loop end

When Auto Punch is on, a red bar connects the red punch points.

When looping is on, a blue loop box connects the blue start and end points.

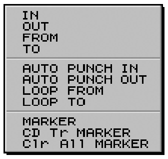
You can place any of these items at the desired locations using onscreen tools. To learn how to place:

- *markers*—see "TAP" on Page 393.
- *edit points*—see Page 406.
- *Auto Punch points*—see Page 391.
- *loop points*—see Page 391.

You can:

- *reposition an object in the measure bar*—by moving your cursor over the object so the cursor becomes a pointing finger, and then dragging to the desired new location.
- *clear an object in the measure bar*—holding down CLEAR on the VS-2400CD, positioning the mouse cursor over the object until it turns into a pointing finger, and then clicking the object.

The Measure Bar Pop-Up Menu


IN
OUT
FROM
TO
AUTO PUNCH IN
AUTO PUNCH OUT
LOOP FROM
LOOP TO
MARKER
CD Tr MARKER
Clr All MARKER

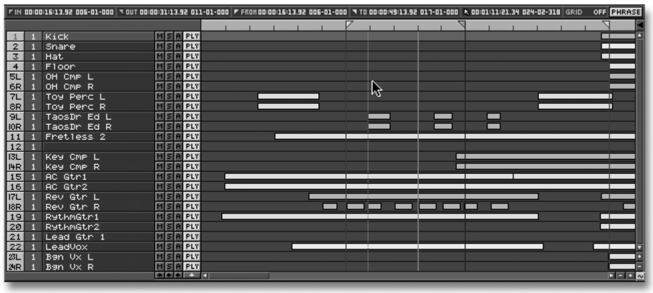
Use the measure bar pop-up menu to quickly place:

- edit points
- loop FROM or TO points
- CD track markers
- Auto Punch IN or OUT points
- markers

Right-click in the measure bar at the desired time location and select the object you want from the measure bar pop-up menu.

To delete all markers and CD track markers from a project, select Clr All MARKER from the measure bar pop-up menu.

Editing VGA Playlist Track Audio


IN 00:00:16:13.92 006-01-000
OUT 00:00:31:13.92 011-01-000
FROM 00:00:16:13.92 006-01-000
TO 00:00:49:13.92 017-01-000
00:01:11:21.34 024-02-318
GRID OFF
PHRASE
1 1 Kick
2 1 Snare
3 1 Hat
4 1 Floor
5L 1 OH Cmp L
6R 1 OH Cmp R
7L 1 Toy Perc L
8R 1 Toy Perc R
9L 1 TaosDr Ed L
10R 1 TaosDr Ed R
11 1 Fretless 2
12 1
13L 1 Key Cmp L
14R 1 Key Cmp R
15 1 AC Gtr1
16 1 AC Gtr2
17L 1 Rev Gtr L
18R 1 Rev Gtr R
19 1 RythmGtr1
20 1 RythmGtr2
21 1 Lead Gtr 1
22 1 LeadVox
23L 1 Bgn Vx L
24R 1 Bgn Vx R
M S A PLY
Position line
Now line

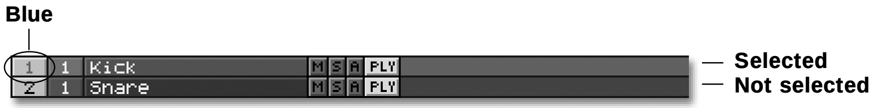
Editing track audio on the VGA main display is very much like editing with your mouse on the VS-2400CD's internal LCD. To learn about editing audio with your mouse, see Page 238.

The ways in which editing on the VGA differs from editing on the LCD are:

- All edits performed using your mouse on the VGA occur instantly, without dialog windows, to make editing fast. You can, of course, undo or redo any edit.
- The SELECT PHRASE (Page 240) and SELECT TRACK (Page 241) pop-up menus are available only on the LCD.

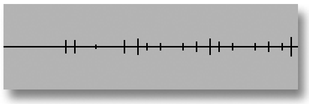
Selecting Tracks on the VGA

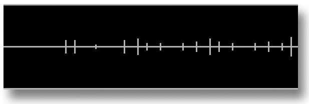
To select a track on the VGA main display, click anywhere on the track in the playlist. When a track is selected, its background changes to a lighter shade of gray and its number turns blue.


Blue
1 1 Kick
2 1 Snare
M S A PLY
Selected
Not selected

Selecting Phrases and Regions on the VGA

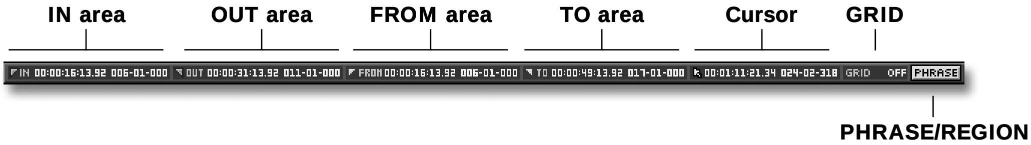
The VS-2400CD automatically assigns an alternating pattern of colors to the phrases in the playlist to make them easy to distinguish from one another. When a phrase or region is selected, it turns black and is outlined in its original color. Its editing waveform changes from black to the original color of the phrase.


Not selected

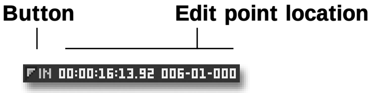


The Edit Control Strip

Above the playlist you'll find the edit control strip, which contains basic editing tools.


IN area
OUT area
FROM area
TO area
Cursor
GRID
IN 00:00:16:13.92 006-01-000
OUT 00:00:31:13.92 011-01-000
FROM 00:00:16:13.92 006-01-000
TO 00:00:49:13.92 017-01-000
00:01:11:21.34 024-02-318
GRID
OFF
PHRASE
PHRASE/REGION

IN, OUT, FROM and TO Areas


Button
Edit point location
IN 00:00:16:13.92 006-01-000

The IN area

The IN, OUT, FROM and TWO areas allow you to set edit points (Page 232), jump to them and clear them. Each has a colored triangular button matching its playlist flag and a readout with its current position. To:

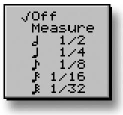
- *Place an edit point*—move the now line to the desired location and click the edit point's button.
- *Change an edit point's location*—move the now line to the desired location and click the edit point's button.
- *Move the now line to an edit point*—hold down SHIFT on the VS-2400CD and click the edit point's onscreen button.
- *Clear an edit point*—hold down CLEAR on the VS-2400CD and click the edit point's onscreen button.

You can re-configure the behavior of the edit point buttons by setting the EDIT POINT Sw TYPE parameter, as described on Page 234.

Cursor

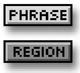
The cursor readout shows the current location of the mouse cursor to help you make edits precisely. The readout shows its position in time code and measures and beats.

GRID


✓Off
Measure
1/2
1/4
1/8
1/16
1/32

Click GRID to display a pop-up menu from which you can activate the desired editing grid (Page 243).

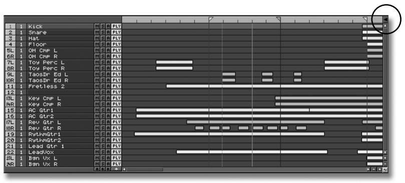
REGION/PHRASE Button


PHRASE
REGION

Click the REGION/PHRASE button to select the desired type of track audio editing.

231

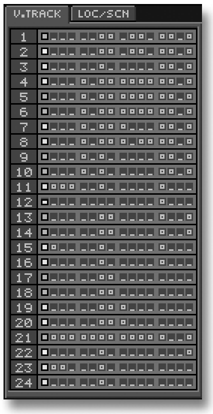
The VGA Playlist Control Panel



Click the Playlist Control button located at the upper right just above the playlist to open the playlist control panel. To close the playlist control panel, click the Playlist Control button again.

You can also show or hide the playlist control panel by holding down SHIFT on the VS-2400CD and pressing its HOME•DISPLAY button.

The V.Track control panel pane allows you to activate any V-Track by clicking on it.

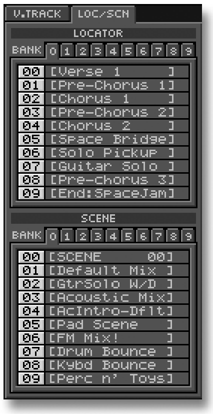


Each track's 16 V-Tracks are arranged in a horizontal row. A symbol shows each V-Track's status.

- ▣ — **Selected, contains audio**
- ◘ — **Selected, no audio**
- ■ — **Not selected, no audio**
- ⊡ — **Not selected, has audio**

Any V-Track that's selected for editing flashes. Destination V-Tracks also flash, outlined in gray. See Page 240 for details.

Click the control panel's LOC/SCN tab to display the LOC/SCN (Locator/Scene) pane.



00 [Verse 1]
01 [Pre-Chorus 1]
02 [Chorus 1]
03 [Pre-Chorus 2]
04 [Chorus 2]
05 [Space Bridge]
06 [Solo Pickup]
07 [Guitar Solo]
08 [Pre-chorus 3]
09 [End:SpaceJam]

00 [SCENE 00]
01 [Default Mix]
02 [GtrSolo W/D]
03 [Acoustic Mix]
04 [AcIntro-Dflt]
05 [Pad Scene]
06 [FM Mix!]
07 [Drum Bounce]
08 [Kybd Bounce]
09 [Perc n' Toys]

Select locator banks with these buttons.

Perform locator actions by clicking these buttons

Select scene banks with these buttons.

Perform scene actions by clicking these buttons

In the LOC/SCN pane, you can quickly store, recall and clear locators and scenes right from the playlist.

Use the upper half of the pane for locator operations. To:

- *change locator banks*—click the desired bank's number.
- *store a locator*—move the now line to the desired location and click the number of an unused locator position.
- *recall a locator*—click the locator's number.
- *clear a locator*—hold down CLEAR on the VS-2400CD and click the locator's number.

Use the lower half of the pane for scene operations. To:

- *change scene banks*—click the desired bank's number.
- *store a scene*—set up your mixer settings as desired and click the number of an unused scene position.
- *recall a scene*—click the scene's number.
- *clear a scene*—hold down CLEAR on the VS-2400CD and click the scene's number.

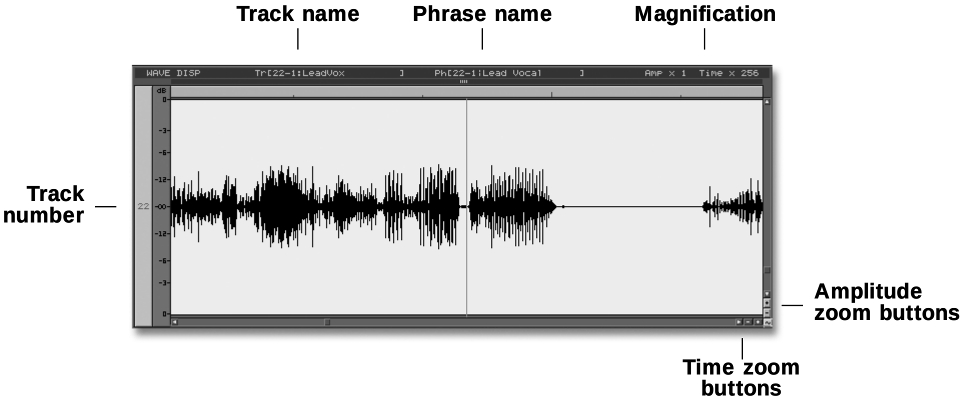
To name a locator or scene—or perform other locator/scene operations—click the LOC or SCN buttons (Page 393), respectively.

The VGA Wave Display

Click the WAVE DISPLAY button in the lower right-hand corner of the playlist to open the wave display.

235

The VGA wave display allows you to view a single track's audio with the maximum amount of detail for precision editing operations.

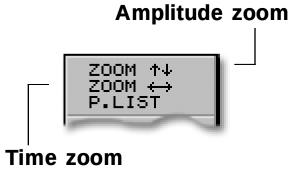

Track name
Phrase name
Magnification
WAVE DISP
Tr[22-1:LeadVox]
Ph[22-1:Lead Vocal]
Amp x 1 Time x 256
Track number
22
Amplitude zoom buttons
Time zoom buttons

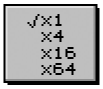
The currently selected track's number appears at the left of the wave display. To view other tracks, drag the vertical scroll bar up and down or click the desired vertical scroll button. To move through the project, drag the horizontal scroll bar or click the horizontal scroll buttons.

You can zoom in or out by clicking the wave display's zoom buttons. To zoom:

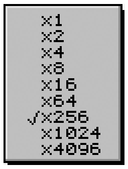
- *vertically*—click the desired amplitude zoom button.
- *horizontally*—click the desired time zoom button.

You can also select the desired amplitude or time zoom value from the Edit Pop-Up menu that appears when you right-click in the wave display.


Amplitude zoom
ZOOM ↑↓
ZOOM ↔
P.LIST
Time zoom


√x1
x4
x16
x64

Amplitude zoom


x1
x2
x4
x8
x16
x64
√x256
x1024
x4096

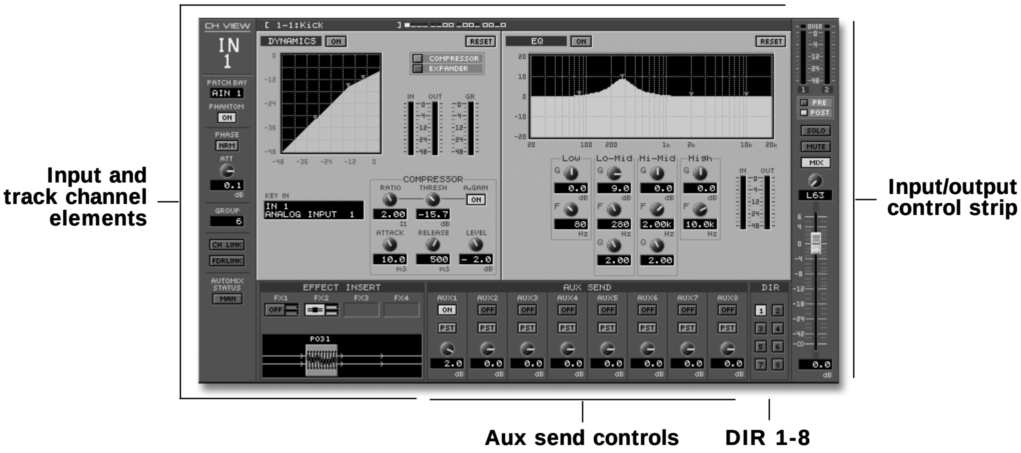
Time zoom

The time zoom is measured in samples.

To close the wave display, click the WAVE DISPLAY button again.

32—VGA Main Display CH VIEW Screens

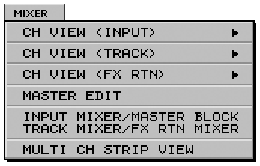
You can control the signal flowing through any input, track or FX return channel on its VGA main display CH VIEW screen.


Input and track channel elements
Input/output control strip
Aux send controls
DIR 1-8

This illustration shows an input channel's CH VIEW screen. The track channel and FX return channel CH VIEW screens look slightly different.

To learn about the input and track channel CH EDIT parameters, see Chapter 11. The FX return channels' CH EDIT parameters are described in Chapter 17.

Displaying CH EDIT Parameters on the VGA


MIXER
CH VIEW <INPUT>
CH VIEW <TRACK>
CH VIEW <FX RTN>
MASTER EDIT
INPUT MIXER/MASTER BLOCK
TRACK MIXER/FX RTN MIXER
MULTI CH STRIP VIEW

You can display the desired CH VIEW screen by selecting it from the MIXER menu. To view the CH VIEW screen for:

- *an input channel*—select the desired input channel from the CH VIEW (INPUT) submenu.
- *a track channel*—select the desired track channel from the CH VIEW (TRACK) submenu.
- *an FX return channel*—select the desired FX return channel from the CH VIEW (FX RTN) submenu.

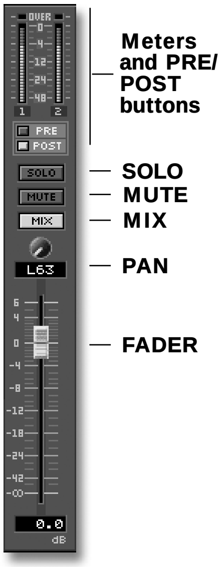
You can also:

- press the desired channel's CH EDIT button on the VS-2400CD (see Page 134).
- view a track channel's CH VIEW screen by clicking its track number in the VGA main display's Home screen.

Universal CH VIEW Elements

The CH VIEW screens for input, track and FX return channels differ slightly, though they contain some common elements. The following section describes those elements.

Input/Output Control Strip



The input/output control strip appears on the right side of all of the VGA CH VIEW screens. This strip presents parameters that allow you to control the output of the channel strip, and meter its input or output. The following section describes how the strip works with a single unlinked channel. Page 411 discusses how the strip works with linked channels.

Meters and PRE/POST Buttons

The meters allow you to view the level of signal coming into or going out of the channel. The PRE and POST buttons determine the signal level to be displayed. To view the level of signal:

- *coming into the channel*—click PRE.
- *going out of the channel*—click POST.

The CH VIEW meters are presented in pairs. With input and track channels, you can see the levels for the odd/even pair of channels to which the currently selected channel belongs—there's a number beneath each meter to show the channel signal it represents. With the stereo FX return channels, the two meters show the left- and right-side signal levels.

149, 225

SOLO Button

To isolate the channel's signal by silencing all un-soloed channels, click SOLO so it lights. To un-solo the channel, click SOLO again.

138

MUTE Button

To silence the channel's signal, click MUTE so it lights. To un-mute it, click the button again.

138

MIX Button

Click MIX so it lights to send the track channel's signal into the MASTER bus, the main stereo mix. Turn it off to remove the signal from the mix.

149, 226

PAN/BAL Knob

Set the stereo placement of the channel's output in the MASTER stereo mix by dragging its PAN knob—or BAL knob in an FX return channel—up or down.

152, 225

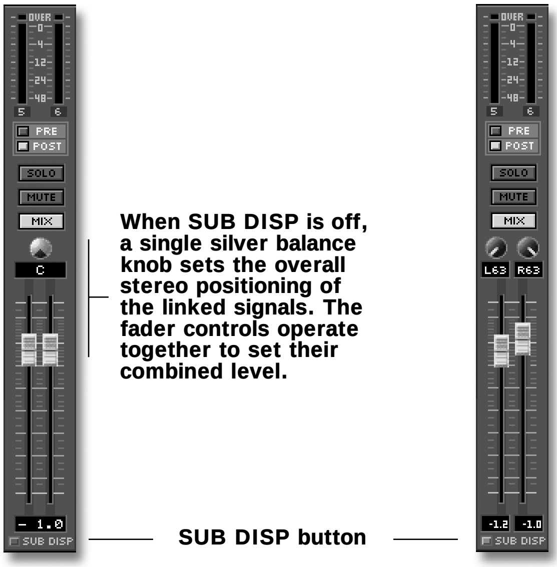
FADER

Drag the fader up or down to set the channel's output level—this serves the same purpose as moving its physical fader. The readout beneath the fader shows the channel's output level in dB.

150, 226

The Input/Output Strip in Linked Channels

When channels are linked, a special SUB DISP ("SUB DISPLAY") button becomes available at the bottom of the strip. You can control the two channels together or set each channel's panning and level individually by clicking SUB DISP so it lights.

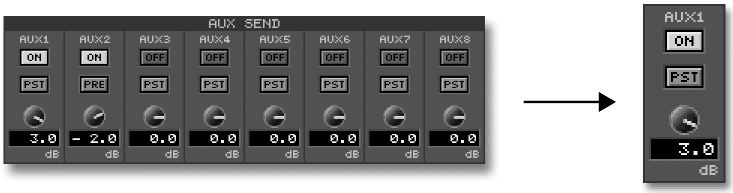


When SUB DISP is off, a single silver balance knob sets the overall stereo positioning of the linked signals. The fader controls operate together to set their combined level.

When SUB DISP is on, individual PAN knobs become available, and each fader controls the level of its channel.

SUB DISP button

AUX Send Controls



Send Status button

PRE/POST switch

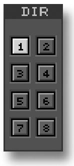
Send level knob

The CH VIEW screens contain AUX send controls with which you can send the signal from any input, track or FX return channel to any of the VS-2400CD's eight Aux busses. To:

- *turn on the send to an Aux bus*—click the bus's Send Status button so it lights.
- *set an Aux send level*—drag the Aux bus's Send Level knob up or down as desired.
- *change the pre/post configuration of an Aux bus*—click the PRE/POST switch repeatedly to select PRE or POST.

When you change an Aux bus's pre/post setting, you're changing its setting for any channel that's using it, as described on Page 148.

DIR (DIRECT) 1-8 Selector


DIR
1
2
3
4
5
6
7
8

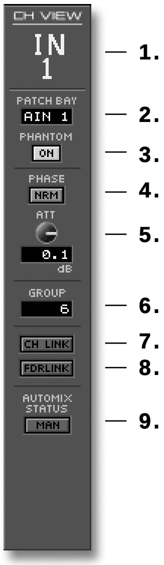
To assign an channel's signal to one of the eight Direct paths, click the desired bus's button in the DIR 1-8 selector.

202

Channel-Specific Parameter Strips

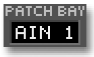
At the left side of each CH VIEW screen is a strip that contains parameters specific to the selected type of channel.

Input Channel Parameter Strip


CH VIEW
IN 1
PATCH BAY
AIN 1
PHANTOM
ON
PHASE
NRM
ATT
0.1
dB
GROUP
6
CH LINK
FDRLINK
AUTOMIX STATUS
MAN
1.
2.
3.
4.
5.
6.
7.
8.
9.

1. Channel Name

2. PATCH BAY Selector

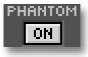

PATCH BAY
AIN 1

Click PATCH BAY to reveal a menu from which you can select the source of the channel's input signal.

160

Inputs are always assignable in pairs, with odd-numbered inputs being assignable to odd-numbered input channels, and so on.

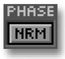
3. PHANTOM Switch



Click PHANTOM—so it's lit—to turn on the corresponding XLR input jack's phantom power.

126

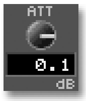
4. PHASE Button



Click PHASE—so it's lit—to reverse the phase polarity of the channel's signal.

150

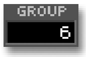
5. ATT Knob



To adjust the level of the input signal coming into the input channel, drag the ATT knob up or down as desired—the readout beneath the knob shows the current amount of attenuation.

148

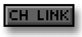
6. GROUP Selector



To assign the input channel to a fader group, click GROUP and select the desired fader group from the pop-up menu.

150

7. CH LINK Button



To link the channel to its odd/even partner so that any changes made to one channel affect both, click CH LINK to turn it on.

147

8. FDRLINK Button

Click FDRLINK—so it's lit—to link the current channel's fader to its odd/even partner so their levels can be set by moving either fader while their other parameters remain independently controllable.

151

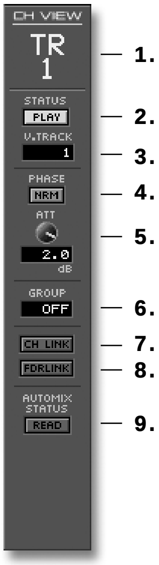
9. AUTOMIX STATUS Button

AUTOMIX
STATUS
MAN

Click the AUTOMIX STATUS button to set the channel's status when Automix is turned on.

316

Track Channel Parameter Strip


CH VIEW
TR
1
STATUS
PLAY
V.TRACK
1
PHASE
NRM
ATT
2.0
dB
GROUP
OFF
CH LINK
FDRLINK
AUTOMIX
STATUS
READ
1.
2.
3.
4.
5.
6.
7.
8.
9.

1. Channel Name

2. STATUS Button

STATUS
PLAY

Click STATUS repeatedly to set the status of the corresponding hard disk recorder track. This is the same as clicking the track channel's TRACK STATUS button on the VS-2400CD.

172

3. V.TRACK Selector

To select a different V-Track, click V.TRACK and select the desired V-Track from the pop-up menu, described on Page 401.

147

4. PHASE Button

Click PHASE—so it's lit—to reverse the phase polarity of the channel's signal.

150

5. ATT Knob

To adjust the level of the signal coming into the track channel from the hard disk recorder, drag the ATT knob up or down as desired—the readout beneath the knob shows the current amount of attenuation.

148

6. GROUP Selector

To assign the track channel to a fader group, click GROUP and select the desired fader group from the pop-up menu.

150

7. CH LINK Button

To link the channel to its odd/even partner so that any changes made to one channel affect both, click CH LINK to turn it on.

147

8. FDRLINK Button

Click FDRLINK—so it's lit—to link the current channel's fader to its odd/even partner so their levels can be set by moving either fader while their other parameters remain independently controllable.

151

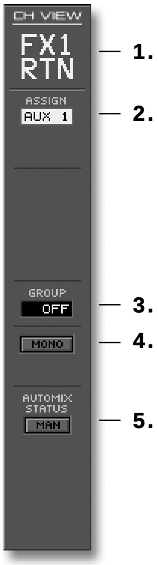
9. AUTOMIX STATUS Button

AUTOMIX
STATUS
MAN

Click the AUTOMIX STATUS button repeatedly to set the channel's status as desired when Automix mode is on.

316

FX Return Channel Parameter Strip



1. Channel Name

2. ASSIGN Selector

ASSIGN
AUX 1

As shipped from the factory, each Aux bus is routed to the input of its same-numbered effect processor. To route a different Aux bus or a Direct path to the FX return channel's processor, click ASSIGN and select the desired bus from the pop-up menu.

224

You can also do this by dragging the routing nodes in the LOOP FX ASSIGN area of the screen, described on Page 418.

3. GROUP Selector

To assign the channel to a fader group, click GROUP and select the desired group from the pop-up menu.

224

4. MONO Switch

By default, the output of an effect processor is stereo. To collapse its left and right sides to a mono signal, click MONO so it lights.

224

5. AUTOMIX STATUS Button

AUTOMIX
STATUS
MAN

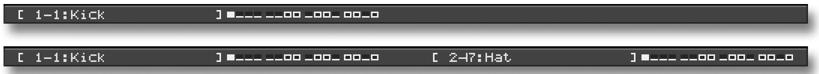
Click the AUTOMIX STATUS button repeatedly to set the channel's status as desired when Automix mode is on.

316

Input and Track Channel CH VIEW Elements

Track/V-Track Info

Track and V-Track info for a standard input or track channel



Track and V-Track info for linked input or track channel

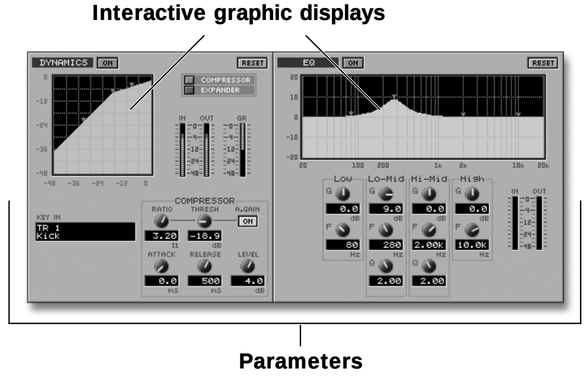
The symbols in the V-Track area are described on Page 401.

At the top edge of an input and track channel CH VIEW screen is information about the corresponding hard disk recorder track and its V-Tracks. If you're working with:

- *an input channel*—the screen shows information regarding the same-numbered hard disk recorder track.
- *a track channel*—the screen shows information about its corresponding track.

If the channel is linked, you'll see track info for both of the corresponding tracks.

Dynamics and EQ Controls

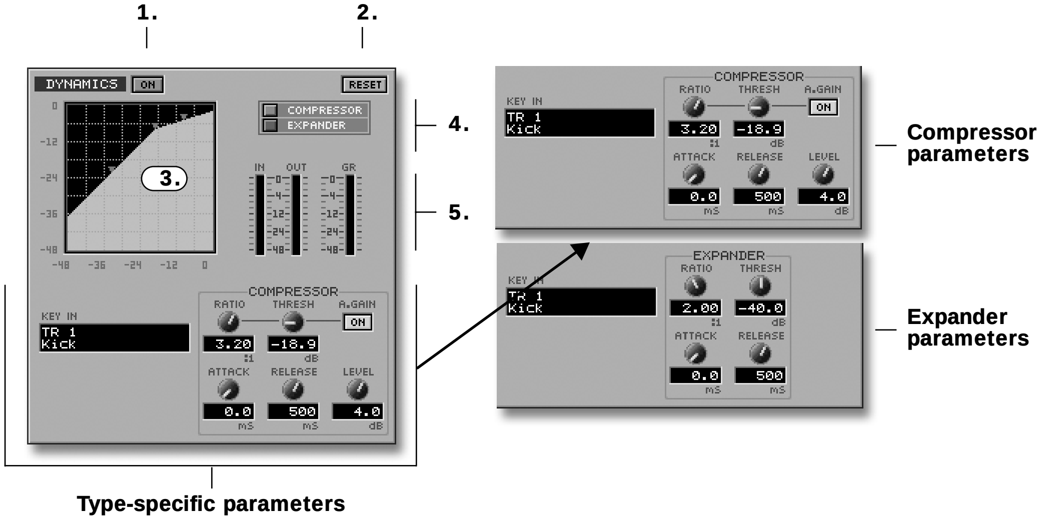

Interactive graphic displays
DYNAMICS
ON
RESET
COMPRESSOR
EXPANDER
IN
OUT
GR
EQ
Low
Lo-Mid
Hi-Mid
High
KEY IN
TR 1
Kick
RATIO
THRESH
A.GAIN
ATTACK
RELEASE
LEVEL
Parameters

For an introduction to dynamics processing, see Page 153.

For an introduction to EQ, see Page 157.

Each input and track channel CH VIEW screen contains a dynamics processor and EQ that can be set up by dragging your mouse in a graphic display, or manually.

Dynamics


1.
2.
3.
4.
5.
DYNAMICS
ON
RESET
COMPRESSOR
EXPANDER
IN
OUT
GR
KEY IN
TR 1
Kick
COMPRESSOR
RATIO
THRESH
A.GAIN
ATTACK
RELEASE
LEVEL
EXPANDER
Compressor parameters
Expander parameters
Type-specific parameters

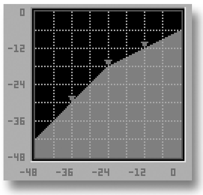
1. DYNAMICS On/Off Button

Turn the dynamics processor on or off by clicking this button—when it's blue, the processor is turned on.

2. RESET Button

Click RESET to return the dynamics processor to its factory default settings.

3. Interactive Dynamics Display


0
-12
-24
-36
-48
-48
-36
-24
-12
0

The interactive dynamics display lets you draw the shape of your processing. Click and drag on any of the red triangles to set the corresponding dynamics parameter.

Page 156 explains how to understand what you see in the graphic dynamics display.

4. Dynamics Type Selector

☐ COMPRESSOR
☐ EXPANDER

Click the desired button to select the type of dynamics processing you want to use.

5. IN/OUT/GR Meters

These meters show, respectively, the signal coming into the processor, going out of it, and the amount of dynamics processing being applied.

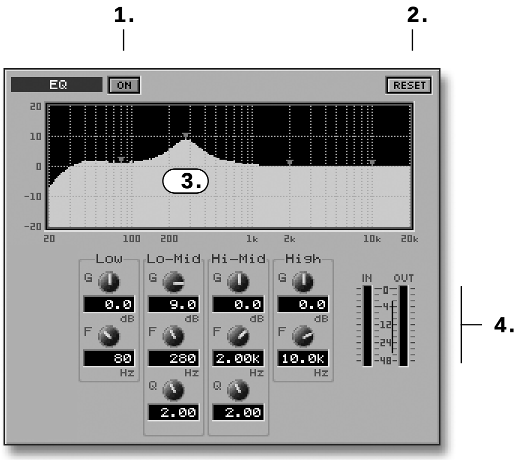
Type-Specific Parameters

The type-specific parameters change according to the type of dynamics processing you select. These parameters are described in Chapter 11.

Compressor Parameters

Parameter:	*For compressor, see:*	*For expander, see:*
KEY IN	Page 156	Page 156
RATIO	Page 154	Page 154
THRESHOLD	Page 154	Page 154
ATTACK	Page 155	Page 155
RELEASE	Page 155	Page 155
A.GAIN	Page 155	*not applicable*
LEVEL	Page 155	*not applicable*

EQ


1.
2.
EQ
ON
RESET
20
10
0
-10
-20
3.
20
100
200
1k
2k
10k
20k
Low
Lo-Mid
Hi-Mid
High
G
0.0
9.0
0.0
0.0
dB
F
80
280
2.00k
10.0k
Hz
Q
2.00
2.00
IN
OUT
0
4
12
24
48
4.

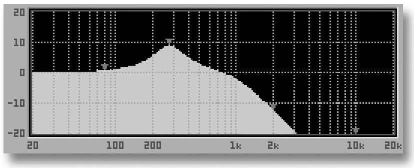
1. EQ On/Off Button

Turn the channel EQ on or off by clicking this button—when it's blue, the EQ is on.

2. RESET Button

Click RESET to return the EQ parameters to their factory default settings.

3. Interactive EQ Display



Draw the desired EQ curve by clicking and dragging on any of the red triangles to set the corresponding EQ band.

4. EQ Meters

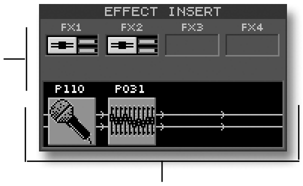
The EQ meters show the level the signal as it comes into the channel EQ and as it leaves it.

EQ Parameters

The CH VIEW EQ parameters are described starting on Page 145.

EFFECT INSERT Controls

Processor buttons

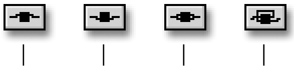


Insert effect matrix

Each available effect processor has its own processor button—in this illustration, only one VS8F-2 effect expansion board is installed, so Effects 3 and 4 aren't available.

Each input and track channel CH VIEW screen contains an EFFECT INSERT matrix in which you can insert an available effect processor—or the left or right side of a processor—into the channel's signal flow. The insert effect matrix shows each effect inserted on the channel, as well as the signal flowing from one insert effect to the next. The number of each processor's currently selected patch is shown in the matrix as well.

To insert an effect on a channel, click the desired processor button repeatedly to select the type of insert routing you want to use. To learn how each of the available routings works, see Page 211.



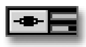
If a processor is already inserted elsewhere, its processor button displays where it's being used.

This effect processor's already being used by Track Channel 1.

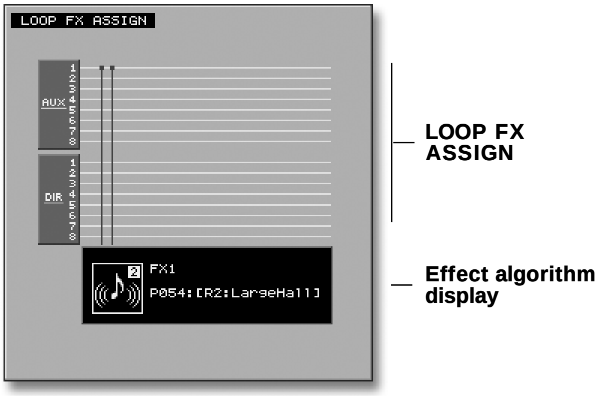
To select or edit an insert effect for a processor, click the effect in the insert effect matrix—the processor’s Algorithm View screen appears on which you can select a new patch or edit the current patch.

221

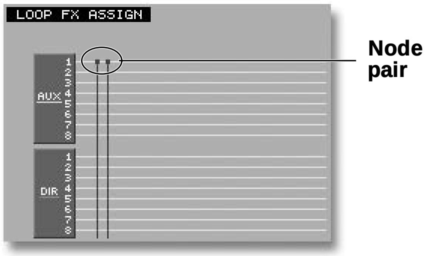
You can adjust the send and return levels to the inserted effect by dragging the blue insert send and return sliders—located to the right of the processor button—up and/or down.


Insert send
Insert return slider

FX Return Channel CH VIEW Elements

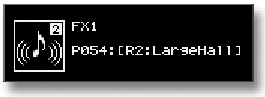

LOOP FX ASSIGN
AUX
1
2
3
4
5
6
7
8
DIR
1
2
3
4
5
6
7
8
2
FX1
P054:[R2:LargeHall]
LOOP FX ASSIGN
Effect algorithm display

LOOP FX ASSIGN


LOOP FX ASSIGN
AUX
1
2
3
4
5
6
7
8
DIR
1
2
3
4
5
6
7
8
Node pair

You can drag the pair of LOOP FX ASSIGN nodes up or down with your mouse to route the desired Aux bus or Direct path to the effect processor associated with the selected FX return channel. (See Page 204.)

Effect Algorithm Display


2
FX1
P054:[R2:LargeHall]

The effect algorithm display shows the effect patch being used by the effect processor associated with the selected FX return channel. Click anywhere on the effect algorithm display to view the processor’s Algorithm View screen on which you can select a different patch or edit the current patch.

33—VGA Main Display Mixer Views

You can select any of the following views from the MIXER menu (Page 388):

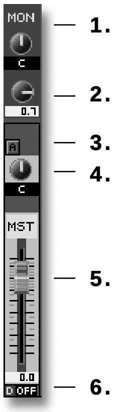
- *Input Mixer/Master Block*—all of the input channels and the MASTER EDIT parameters containing all of the Aux and Direct path settings.
- *Track Mixer/FX Return Mixer*—all of the track channels and FX return channels.
- *Multi-Channel Strip View*—a detailed view of the set of channels currently controlled by the VS-2400CD's 12 physical channel strips (Page 133 and Page 286).

Shared Elements

The Input Mixer/Master Block and Track Mixer/FX Return Mixer views share some elements that we'll describe before proceeding with descriptions of the two views.

Shared MASTER Fader Strip

The MASTER fader strip—located at the right edge of the screen—controls the stereo MASTER bus (see Page 137).



1. MON (MONITOR) Balance Knob

Drag the MON (for "MONITOR") balance knob up or down to shift the MONITOR bus output leftward or rightward, respectively.

2. MON Level Knob (Info Only)

The MON (for "MONITOR") knob shows the level of the MONITOR bus. This level can be adjusted only using the VS-2400CD's MONITOR knob.

3. AUTOMIX STATUS (A) Button

Click the AUTOMIX STATUS button to set the MASTER fader's Automix status when Automix is turned on.

316

4. MASTER Bus Balance

Drag the MASTER balance knob up or down to shift the MASTER bus output leftward or rightward, respectively.

5. MASTER Bus Fader

Drag the MASTER bus fader up or down to set the level of the MASTER bus—this is the same as moving the VS-2400CD's physical MASTER fader. The current MASTER bus level is shown beneath the fader.

137

6. DITHER (D) Button

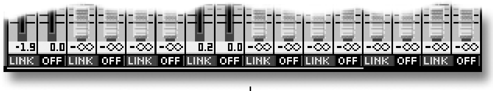
To activate output dithering, click and hold the DITHER button, and select the desired dithering bit depth.

357

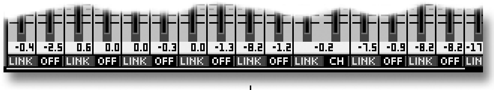
FADER Select Indicator

On the VGA, a colored line appears beneath the set of channels currently assigned to the VS-2400CD's physical channel strips. These channels are selected by pressing the corresponding FADER button on the VS-2400CD (Page 134), or by clicking the virtual FADER buttons in the Multi-Channels Strip view's MASTER fader strip (Page 426). This allows you to tell at a glance if the channel strips you're viewing on the VGA are currently being controlled by the 12 physical channel strips.

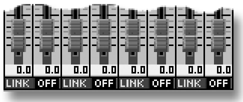
When a set of input channels are selected with the FADER buttons, they're underlined in amber. When track channels are selected, the underline is green. Aux 1-8 and FX return channels are underlined in red when they're being controlled by the faders.



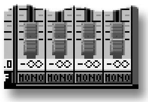
Amber indicator for input channels



Green indicator for track channels



Red indicator for Aux master channels



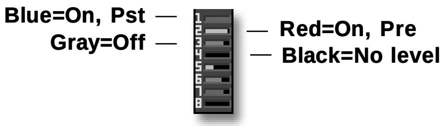
Red indicator for Fx return channels

Aux Send Sliders

In the Input Mixer/Master Block, Track Mixer/FX Return Mixer and Multi-Channel views, input, track and FX return channels all sport Aux send sliders. These sliders allow you to send the desired amount of a channel's signal to any of the eight Aux busses, and show you at a glance each send level. To set an Aux send level, click and drag its slider with your mouse to the desired position.

A slider's color provides information about its Aux send. When a slider is:

- *blue*—the Aux send is on and set to Post.
- *red*—the Aux send is on and set to Pre.
- *gray*—the Aux send is turned off.
- *black*—the send is turned all the way down.



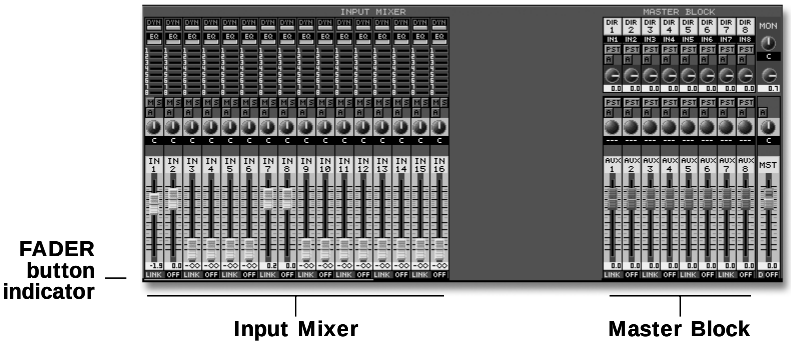
You can change the Aux bus's pre/post setting:

- on any channel's VGA CH VIEW screen (Page 411).
- in the Input Mixer/Master Block view (described on Page 421).
- in the MASTER EDIT window available in the VGA main display's MIXER menu (Page 388).
- in the track controls area in the playlist (Page 400).

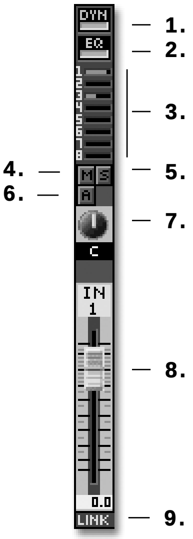
When an odd/even pair of Aux busses is linked, the slider for the even bus is replaced by a panning handle, as described on Page 423.

Input Mixer/Master Block View

Select INPUT MIXER/MASTER BLOCK from the MIXER menu to view all of the VS-2400CD's 16 input channel strips and MASTER BLOCK settings at once on the VGA.



Input Channel Strips



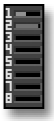
1. DYNAMICS (DYN) On/Off

Click this button to turn the channel's dynamics processor on—so the button's lit—or off. See Page 149.

2. EQ On/Off

To turn the channel's EQ on or off, click this button. When it's lit, the EQ's on. See Page 149.

3. AUX Send Sliders



Set the amount of the channel's signal sent to an Aux bus by adjusting the corresponding AUX send slider. With linked Aux busses, a panning handle replaces the even-numbered Aux bus's slider (Page 423).

148

4. MUTE (M) Button

To mute the channel, click this button so it's lit. To un-mute the channel, click the button again.

138

5. SOLO (S) Button

To solo the channel, click the SOLO button to light it. To un-solo the channel, click the button again.

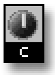
138

6. AUTOMIX STATUS (A) Button

When Automix is turned on, repeatedly click the AUTOMIX STATUS button to set the channel’s Automix status.

316

7. PAN Knob



Set the stereo position of the channel in the main MASTER bus mix by dragging the PAN knob up or down as desired.

152

8. Channel Fader

The position of the channel fader sets the level of signal coming out of the channel. Moving it is the same as moving the channel’s physical fader on the VS-2400CD. The channel’s level is displayed below the fader.

150

9. LINK Switch

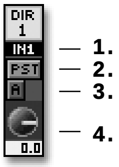
LINK combines the CH EDIT ChLink and F.LINK parameters. Click to the right of “LINK” and select the desired type of linking from the pop-up menu, or turn off linking. The LINK switch occupies the combined lower edge of both of the channels it controls.

147, 151

Master Block Strips

The Master Block strips contain Direct path parameters (Page 202) and Aux bus controls (Page 199).

Direct Path Parameters



1. Source

Click Source and choose the signal you want to assign to the Direct path.

2. Pre/Post Switch

This sets the Direct path to receive a channel’s signal before or after the channel fader.

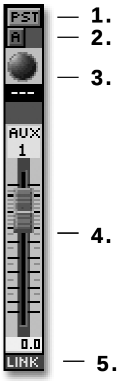
3. AUTOMIX STATUS (A) Button

When Automix is on, repeatedly click this button to set the Direct path’s Automix status.

4. Final Level Knob

Drag this knob up or down to set the final level of the Direct path.

Aux Bus Parameters


PST
A

AUX 1
0.0
LINK
1.
2.
3.
4.
5.

1. PRE/POST Switch

Click the PRE/PST switch to configure the Aux bus to accept channel signals from before or after the channel faders.

2. AUTOMIX STATUS (A) Button

When Automix is on, repeatedly click the AUTOMIX STATUS button to set the Aux bus's Automix status.

3. Linked Aux Bus Balance

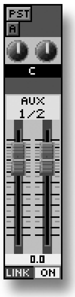
When an odd/even pair of aux busses is linked, this knob become active (see below) and allows you to set the relative levels of the linked busses.

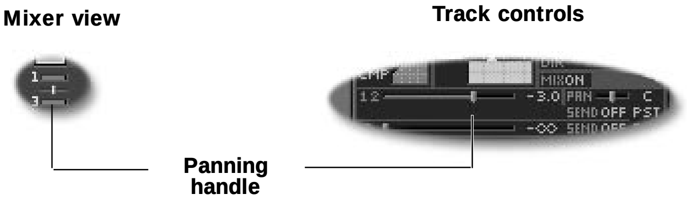
4. Aux Bus Master Level

Drag this knob up or down to set the master level of the Aux bus.

5. LINK

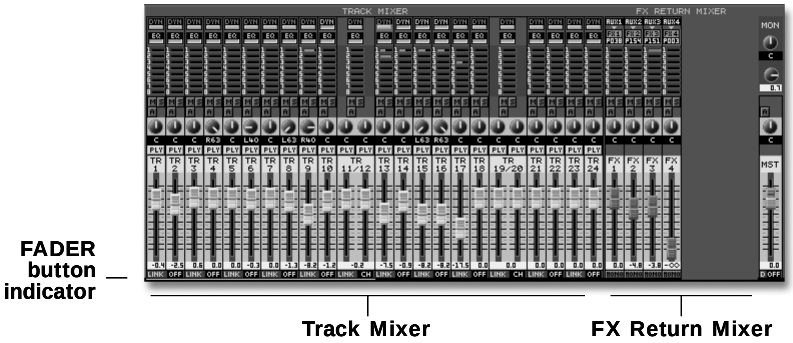
To link or un-link odd/even Aux bus pairs, click the LINK button so it lights. When two Aux busses are linked, their appearance changes onscreen to reflect their combined operation as shown to the right. Their Aux send sliders in the various channel views and the track controls also change—the odd-numbered slider sets the send level, and the even-numbered slider becomes a panning handle that allows you to pan signals between the two linked busses.


PST
A
C
AUX 1/2
0.0
LINK
ON

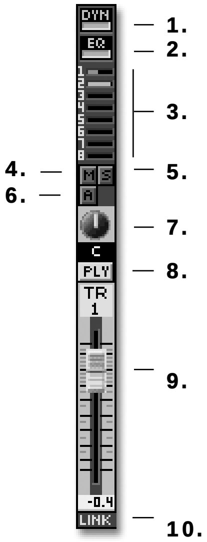

Mixer view
Track controls
1
3
MIXON
12
-3.0
PAN
C
SEND OFF PST
-∞
Panning handle

Track Mixer/FX Return Mixer View

Select TRACK MIXER/FX RTN MIXER from the MIXER menu to view all of the VS-2400CD's 24 track channel and four FX return channel strips at once on the VGA.


TRACK MIXER
FX RETURN MIXER
MON
MST
FADER button indicator
Track Mixer
FX Return Mixer

Track Channel Strips



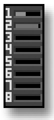
1. DYNAMICS (DYN) On/Off

Click this button to turn the channel's dynamics processor on—when the button's lit—or off. See Page 149.

2. EQ On/Off

To turn the channel's EQ on or off, click this button. When it's lit, the EQ's on. See Page 149.

3. AUX Send Sliders



Set the amount of the channel's signal sent to an Aux bus by adjusting the corresponding AUX send slider. With linked Aux busses, a panning handle replaces the even-numbered Aux bus's slider (Page 423).

148

4. MUTE (M) Button

To mute the channel, click this button so it's lit. To un-mute the channel, click the button again.

138

5. SOLO (S) Button

To solo the channel, click the SOLO button to light it. To un-solo the channel, click the button again.

138

6. AUTOMIX STATUS (A) Button

When Automix is turned on, repeatedly click the AUTOMIX STATUS button to set the channel's Automix status.

316

7. PAN Knob

Set the stereo position of the channel in the main MASTER bus mix by dragging the PAN knob up or down as desired.

152

8. TRACK STATUS Button

Repeatedly click the TRACK STATUS button to set status of the corresponding hard disk recorder track. This is the same thing as pressing the track's TRACK STATUS button on the VS-2400CD.

172

9. Channel Fader

The position of the channel fader sets the level of signal coming out of the channel. Moving the onscreen fader is the same as moving the channel's physical fader on the VS-2400CD.

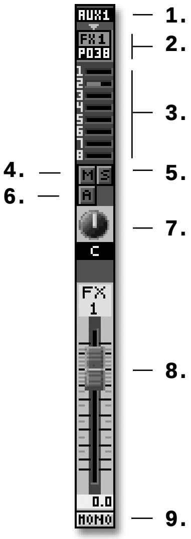
150

10. LINK Switch

LINK combines the CH EDIT ChLink and F.LINK parameters. Click to the right of "LINK" and select the desired type of linking from the pop-up menu, or turn off linking. The LINK switch occupies the combined lower edge of both of the channels it controls.

147, 151

FX Return Channel Strips



1. ASSIGN Button

To designate an Aux bus as the send assigned to the channel's effect processor, click this button and select the desired bus from the pop-up menu.

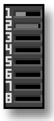
224

2. Algorithm View Button

This button shows the name of the channel's processor and its currently selected effect patch. Click the button to display the Algorithm View screen from which you can select a new patch or edit the current patch.

215

3. AUX Send Sliders



Set the amount of the channel's signal sent to an Aux bus by adjusting the corresponding AUX send slider. With linked Aux busses, a panning handle replaces the even-numbered Aux bus's slider (Page 423).

226

4. MUTE (M) Button

To mute the channel, click this button so it's lit. To un-mute the channel, click the button again.

138

5. SOLO (S) Button

To solo the channel, click the SOLO button to light it. To un-solo the channel, click the button again.

138

6. AUTOMIX STATUS (A) Button

When Automix is turned on, repeatedly click the AUTOMIX STATUS button to set the channel's Automix status.

316

7. BAL (Balance) Knob

Set the stereo position of the channel in the main MASTER bus mix by dragging the BAL knob up or down as desired.

225

8. Channel Fader

The position of the channel fader sets the level of signal coming out of the channel. Moving the onscreen fader is the same as moving the channel's physical fader on the VS-2400CD.

226

9. MONO Switch

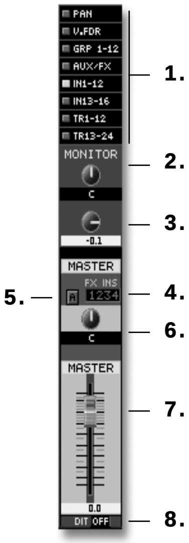
Click this button—so it lights—to collapse the effect processor's stereo output to a mono signal.

224

Multi-Channel Strip Views

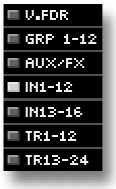
The multi-channel strip views show a detailed view of the set of 12 channels currently selected with the FADER buttons. To view the desired set of multi-channel strips, click the desired FADER button, described below. There are eight onscreen FADER buttons.

The Multi-Channel View MASTER Strip


PAN
V.FDR
GRP 1-12
AUX/FX
IN1-12
IN13-16
TR1-12
TR13-24
MONITOR
C
-0.1
MASTER
FX INS
A
1234
C
MASTER
0.0
DIT OFF
1.
2.
3.
4.
5.
6.
7.
8.

All of the multi-channel views share a common MASTER strip. This section describes what you'll find in this strip.

1. FADER/V.FDR buttons


V.FDR
GRP 1-12
AUX/FX
IN1-12
IN13-16
TR1-12
TR13-24

The FADER PAN button lets you use the faders for stereo placement of the selected channels' signals. Since it doesn't select channels itself, it's not shown here.

These buttons perform the same job as the VS-2400CD's top-panel FADER buttons. To view a set of 12 channel strips, click the corresponding button. To view the V.FADERS, click V.FDR.

134

2. MON (MONITOR) Balance Knob

Drag the MON (for "MONITOR") balance knob up or down to shift the MONITOR bus output leftward or rightward, respectively.

3. MON (MONITOR) Level Knob (Info Only)

The MON (for "MONITOR") knob shows the level of the MONITOR bus. This level can be adjusted only using the VS-2400CD's MONITOR knob.

4. MASTER Bus Effect Insert

To insert an effect processor on the MASTER bus, click its number—the MASTER EFFECT INSERT screen appears.

213

5. AUTOMIX STATUS Button

Click the AUTOMIX STATUS button to set the MASTER fader's Automix status when Automix is turned on.

316

6. MASTER Bus Balance Knob

Drag the MASTER bus balance knob up or down to shift the MASTER bus output right or left, respectively.

7. MASTER Bus Fader

Drag the MASTER bus fader up or down to set the level of the MASTER bus—this is the same thing as moving the physical MASTER fader on the VS-2400CD. The current MASTER bus level is shown beneath the fader.

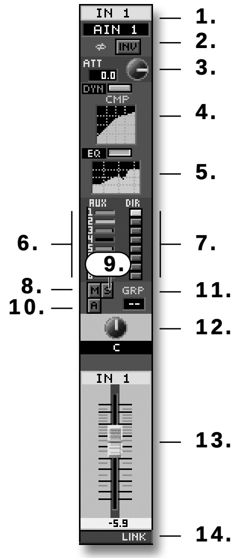
137

8. DITHER

To activate output dithering, click and hold the DITHER button and select the desired dithering bit depth.

357

Multi-Channel View Input Channels



1. Input Signal Selector

Click the input signal selector to select the desired input signal for the channel. Odd-numbered inputs can be assigned to odd-numbered input channels, and even-numbered inputs to even-numbered input channels.

160

2. PHASE (INV) Button

Click the PHASE button so it lights to reverse the phase polarity of the input channel's signal.

150

3. ATT Knob

The ATT knob sets the level of the signal coming into the channel as shown to the left of the knob.

148

4. DYNAMICS (DYN) Switch and Overview

Turn on the channel's dynamics processor by clicking the DYN switch so it lights. The selected type of dynamics processor is shown beneath the switch along with the current dynamics curve.

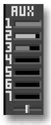
149

5. EQ Switch and Overview

Turn on the channel's EQ by clicking the EQ switch so it lights. The current EQ curve appears below the switch.

149

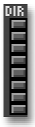
6. AUX Send Sliders



Set the amount of the channel's signal sent to an Aux bus by adjusting the corresponding AUX send slider. With linked Aux busses, a panning handle replaces the even-numbered Aux bus's slider (Page 423).

148

7. DIR (DIRECT) 1-8 Selector



To route the channel's signal to a Direct path, click the desired bus's number.

151

8. MUTE (M) Button

To mute the channel, click this button so it's lit. To un-mute the channel, click the button again.

138

9. SOLO (S) Button

To solo the channel, click the SOLO button to light it. To un-solo the channel, click the button again.

138

10. AUTOMIX STATUS (A) Button

When Automix is turned on, repeatedly click the AUTOMIX STATUS button to set the channel's Automix status.

316

11. GRP (GROUP) Selector

To assign the channel to a fader group, click beneath "GRP" and select the desired fader group from the pop-up menu.

150

12. PAN Knob

Set the stereo position of the channel in the main MASTER bus mix by dragging the PAN knob up or down as desired.

152

13. Channel Fader

The position of the fader sets the level of signal coming out of the channel. Moving the onscreen fader is the same as moving the channel's physical fader on the VS-2400CD.

150

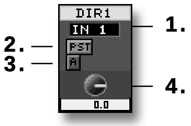
14. LINK Switch

LINK combines the CH EDIT ChLink and F.LINK parameters. Click to the right of "LINK" and select the desired type of linking from the pop-up menu, or turn off linking. The LINK switch occupies the combined lower edge of both of the channels it controls.

147, 151

Multi-Channel View Aux and Direct Path Channels

Direct Path Parameters



1. Source

Click Source and choose the signal to be assigned to the Direct path.

2. Pre/Post Switch

This sets the Direct path to receive a channel's signal before or after the channel fader.

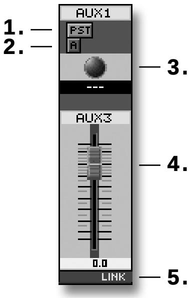
3. AUTOMIX STATUS (A) Button

When Automix is on, repeatedly click this button to set the Direct path' Automix status.

4. Final Level Knob

Drag this knob to set the final level of the Direct path.

Aux Bus Parameters



1. PRE/POST Switch

Click the PRE/PST switch to configure the Aux bus to accept channel signals from before or after the channel faders.

2. AUTOMIX STATUS (A) Button

When Automix is on, repeatedly click the AUTOMIX STATUS button to set the Aux bus's Automix status.

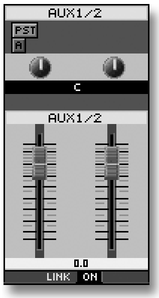
3. Linked Aux Bus Balance

When an odd/even pair of aux busses is linked, this knob becomes active (see below) and allows you to set the left/right balance of the pair of busses.

4. Aux Bus Master Level

Drag this knob to set the master level of the Aux bus.

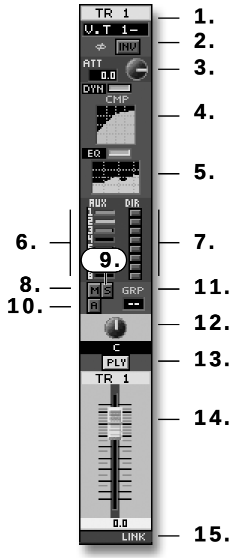
5. LINK



To link or un-link odd/even Aux bus pairs, click the LINK button so it lights. When two Aux busses are linked, their appearance changes onscreen to reflect their combined operation.

In the VGA, linked Aux busses change the way in which their Aux send sliders are shown in the various channel views and the track controls, as explained on Page 423.

Multi-Channel View Track Channels



1. V-Track Selector

Click the V-Track signal selector to assign the desired V-Track to the track channel.

147

2. PHASE (INV) Button

Click the PHASE button so it lights to reverse the phase polarity of the input channel's signal.

150

3. ATT Knob

Drag the ATT slider to adjust the level of the signal coming into the channel. The signal's level is shown to the left of the knob.

148

4. DYNAMICS (DYN) Switch and Overview

Turn on the channel's dynamics processor by clicking the DYN switch so it lights. The currently selected type of dynamics processor is shown beneath the switch along with the current dynamics curve.

149

5. EQ Switch and Overview

Turn on the channel's EQ by clicking the EQ switch so it lights. The current EQ curve appears below the switch.

149

6. AUX Send Sliders

Set the amount of the channel's signal sent to an Aux bus by adjusting the corresponding AUX send slider. With linked Aux busses, a panning handle replaces the even-numbered Aux bus's slider (Page 423).

148

7. DIR (DIRECT) 1-8 Buttons

To route the channel's signal to a Direct path, click the desired bus's number.

151

8. MUTE (M) Button

To mute the channel, click this button so it's lit. To un-mute the channel, click the button again.

138

9. SOLO (S) Button

To solo the channel, click the SOLO button to light it. To un-solo the channel, click the button again.

138

10. AUTOMIX STATUS (A) Button

When Automix is turned on, repeatedly click the AUTOMIX STATUS button to set the channel's Automix status.

316

11. GRP (GROUP) Selector

To assign the channel to a fader group, click beneath "GRP" and select the desired fader group from the pop-up menu.

150

12. PAN Knob

Set the stereo position of the channel in the main MASTER bus mix by dragging the PAN knob up or down as desired.

152

13. TRACK STATUS Button

Click a TRACK STATUS button repeatedly to set its track's status—this is the same as pressing the corresponding physical TRACK STATUS button on the VS-2400CD.

172

14. Channel Fader

The position of the channel fader sets the level of signal coming out of the channel. Moving the onscreen fader is the same as moving the channel's physical fader on the VS-2400CD.

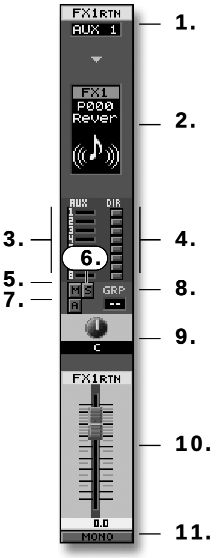
150

15. LINK Switch

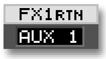
LINK combines the CH EDIT ChLink and F.LINK parameters. Click to the right of "LINK" and select the desired type of linking from the pop-up menu, or turn off linking. The LINK switch occupies the combined lower edge of both of the channels it controls.

147, 151

Multi-Channel View FX Return Channels



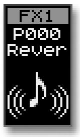
1. ASSIGN Selector



You can click the ASSIGN selector and choose the Aux bus that'll carry signals to the FX return channel's effect processor.

224

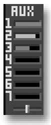
2. EFFECT Algorithm Display



The EFFECT algorithm display shows the corresponding effect processor's currently selected effect algorithm. Click the display to open the Algorithm View screen from which you can select a different effect patch, or edit the current patch.

215

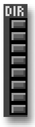
3. AUX Send Sliders



Set the amount of the channel's signal sent to an Aux bus by adjusting the corresponding AUX send slider. With linked Aux busses, a panning handle replaces the even-numbered Aux bus's slider (Page 423).

226

4. DIR (DIRECT) 1-8 Selector



To route the channel's signal to a Direct path, click the desired bus's number.

225

5. MUTE (M) Button

To mute the channel, click this button so it's lit. To un-mute the channel, click the button again.

138

6. SOLO (S) Button

To solo the channel, click the SOLO button to light it. To un-solo the channel, click the button again.

138

8. GRP (GROUP) Selector

To assign the channel to a fader group, click beneath "GRP" and select the desired fader group from the pop-up menu.

224

9. BAL (Balance) Knob

Set the stereo position of the channel in the main MASTER bus mix by dragging the BAL knob up or down as desired.

225

10. Channel Fader

The position of the channel fader sets the level of signal coming out of the channel. Moving the onscreen fader is the same as moving the channel's physical fader on the VS-2400CD.

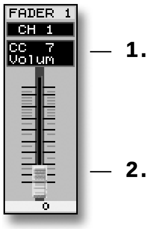
226

11. MONO Switch

Click the MONO switch to collapse the corresponding effect processor's stereo output to a mono signal.

224

Multi-Channel View V.FADER Channels



In V.FADER mode, each channel strip's channel fader can transmit MIDI Control Change values on the corresponding MIDI channel. The V.FADER feature is described on Page 286.

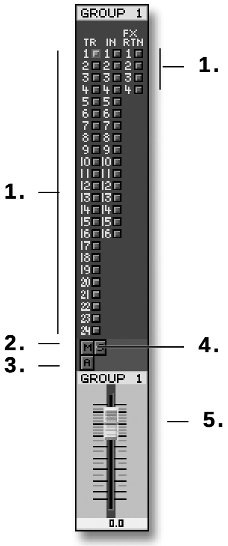
1. Channel Fader Control Change Selector

The channel fader Control Change selector shows the MIDI Control Change whose values are transmitted from the VS-2400CD when the channel's fader is moved. Click the selector and drag up or down to select a different Control Change.

2. Channel Fader

Drag the onscreen fader up or down—or move the corresponding physical fader on the VS-2400CD—to transmit the selected Control Change value.

Multi-Channel View Fader Group Channels



In the multi-channel view, you can see the channel currently assigned to any fader group and easily add or remove channels from a fader group. You can also mute, solo and Automix them.

To assign a channel to a fader group:

1. Channel Group Assignment Switches

To assign an track, input or FX return channel to a fader group, click the channel's switch—so it lights—in the desired group's channel strip. To remove the channel from the group, click the switch again.

2. MUTE (M) Button

To mute the fader group, click this button so it's lit. To un-mute the group, click the button again.

138

3. SOLO (S) Button

S

To solo the fader group, click the SOLO button to light it. To un-solo the group, click the button again.

138

4. AUTOMIX STATUS (A) Button

A

When Automix is turned on, repeatedly click the AUTOMIX STATUS button to set the fader group's Automix status.

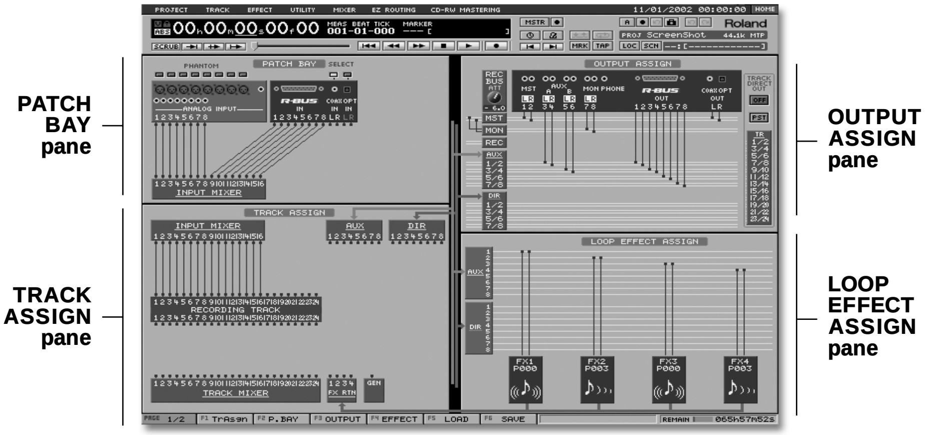
316

5. Channel Fader

Drag a fader group's onscreen fader up or down to set the fader group's level—this is the same as moving its physical fader.

34—VGA Main Display EZ ROUTING Screen

The VGA main display displays all four of the VS-2400CD's EZ ROUTING screens at the same time to make all of your routing simple to perform.


PATCH BAY pane
TRACK ASSIGN pane
OUTPUT ASSIGN pane
LOOP EFFECT ASSIGN pane
PROJECT TRACK EFFECT UTILITY MIXER EZ ROUTING CD-RW MASTERING
PATCH BAY
INPUT MIXER
TRACK ASSIGN
RECORDING TRACK
TRACK MIXER
OUTPUT ASSIGN
LOOP EFFECT ASSIGN
FX1 FX2 FX3 FX4
1/2 TrAsgn P.BAY OUTPUT EFFECT LOAD SAVE

To display the EZ ROUTING screens, press EZ ROUTING on the VS-2400CD or select ROUTING VIEW from the EZ ROUTING menu (Page 388).

On the VGA main display, the VS-2400CD's top-panel analog inputs and rear-panel inputs and outputs look just like their physical counterparts on the VS-2400CD itself, making it easy to visualize the input and output connections you're making.

The F buttons beneath the EZ ROUTING screen are the same as those found on the VS-2400CD's internal LCD EZ ROUTING screens.

The LOAD and SAVE features behave as described in Chapter 22.

Making Connections

Routing on the VGA operates on the same principles as routing on the VS-2400CD's internal LCD. To learn about routing, see Page 227.

You can route signals on the VGA by:

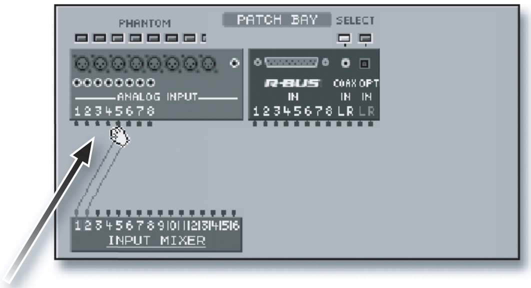
- selecting the desired connection node with the ◀, ▶, ▲ or ▼ buttons and turning the Time/Value dial to make the desired connection.
- dragging the desired connections into place using your mouse.

Routing on the VGA Using a Mouse

To perform routing your mouse, position the mouse cursor over the desired connection point until it turns into a pointing finger and then drag your mouse to the desired destination.

Input to Input Channel Mouse Routing

Input signal to input channel routing occurs in the EZ ROUTING PATCH BAY pane.


PHANTOM
PATCH BAY
SELECT
ANALOG INPUT
1 2 3 4 5 6 7 8
R-BUS IN
COAX IN
OPT IN
1 2 3 4 5 6 7 8 L R L R
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
INPUT MIXER

To make a new connection:

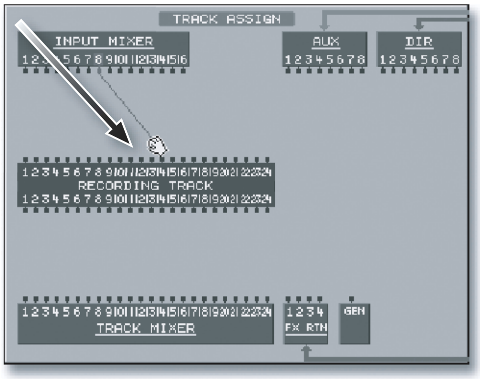
1. Position the mouse cursor over the desired input channel pair until the cursor changes to a pointing finger.
2. Click and drag the mouse to the desired pair of input jacks or connectors—a virtual cable appears onscreen to show the connection you're making, as shown above.

To change or delete an existing connection:

1. Position the mouse cursor over the desired input channel pair until the cursor changes to a pointing finger and click once.
2. Position the mouse cursor over the desired input jack or connector pair until the cursor changes to a pointing finger.
3. Click and drag the mouse left or right to select a new input channel pair or all the way to the left to delete the connection.

Routing Signals to a Recording Track Using a Mouse

The procedures for routing a signal from an input channel, track channel, FX return channel, Aux bus, Direct path or generator (Page 364) to a recording tracks are the same, and take place in the TRACK ASSIGN EZ ROUTING pane.


TRACK ASSIGN
INPUT MIXER
AUX
1 2 3 4 5 6 7 8
DIR
1 2 3 4 5 6 7 8
RECORDING TRACK
TRACK MIXER
1 2 3 4
FX RTN
GEN

To make a new connection:

1. Position the mouse cursor over the connection node you want to route to the track.
2. Click and drag the mouse to the desired recording track—a virtual cable appears onscreen to show the connection you're making.

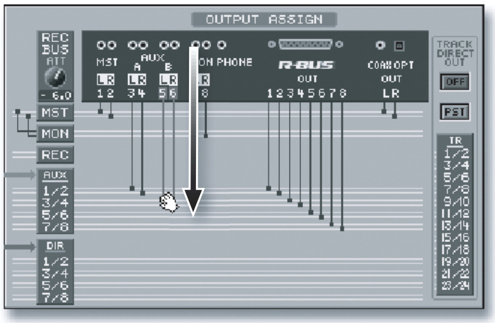
To change or delete an existing connection:

1. Position the mouse cursor over the desired recording track until the cursor changes to a pointing finger.
2. Click and drag the mouse left or right to select a new track or all the way left to delete the connection.

Routing Signals to Outputs Using a Mouse

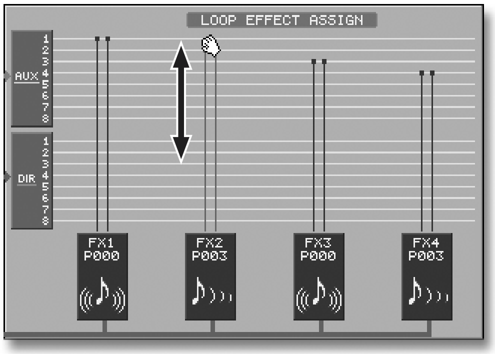
You can route any busses or tracks to the desired output jacks or connectors in the OUTPUT ASSIGN pane using the principles described on Page 271. To route tracks to output jacks, click the TRACK DIRECT OUT button (Page 274) so it lights and click the PRE/PST button to set it as desired.

To make or break a connection in the OUTPUT ASSIGN pane, position the mouse cursor over the desired connection node and drag upward or downward as desired.


OUTPUT ASSIGN
REC BUS ATT
-6.0
MST
MON
REC
AUX
1/2
3/4
5/6
7/8
DIR
1/2
3/4
5/6
7/8
MST
AUX
A
B
ON PHONE
LR LR LR LR
1 2 3 4 5 6 7 8
R-BUS
OUT
1 2 3 4 5 6 7 8
COAX OPT
OUT
LR
TRACK DIRECT OUT
OFF
PST
TR
1/2
3/4
5/6
7/8
9/10
11/12
13/14
15/16
17/18
19/20
21/22
23/24

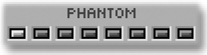
Routing Busses to Internal Effect Using a Mouse

In the LOOP EFFECT ASSIGN pane, you can route any Aux bus or Direct path to the desired internal effect processor (Page 204). To do this, position the mouse cursor over the desired bus's node and drag upward or downward as desired.


LOOP EFFECT ASSIGN
AUX
1
2
3
4
5
6
7
8
DIR
1
2
3
4
5
6
7
8
FX1
P000
FX2
P003
FX3
P000
FX4
P003

Other Onscreen EZ ROUTING Tools

Phantom Power Switches



On —

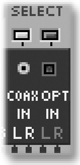
You can turn on phantom power (Page 126) to any of the XLR input jacks by clicking its button in the PATCH BAY pane so the button lights. To turn off phantom power, click the button again so its light goes out.

You can jump to the first phantom power button by holding down SHIFT and pressing EZ ROUTING•PHANTOM.

Activating Digital Inputs

The VS-2400CD can receive up to 10 digital input signals at a time. The R-BUS connections are always active. You can activate the desired stereo coaxial or optical digital inputs as described on Page 127.

On the VGA, every possible combination is represented by a digital input selector button in the PATCH BAY pane. Each currently selected digital connection turns white to show that it's activated and available for use.



In this illustration, you can see that the coaxial digital inputs are active, and that the optical digital inputs are not.

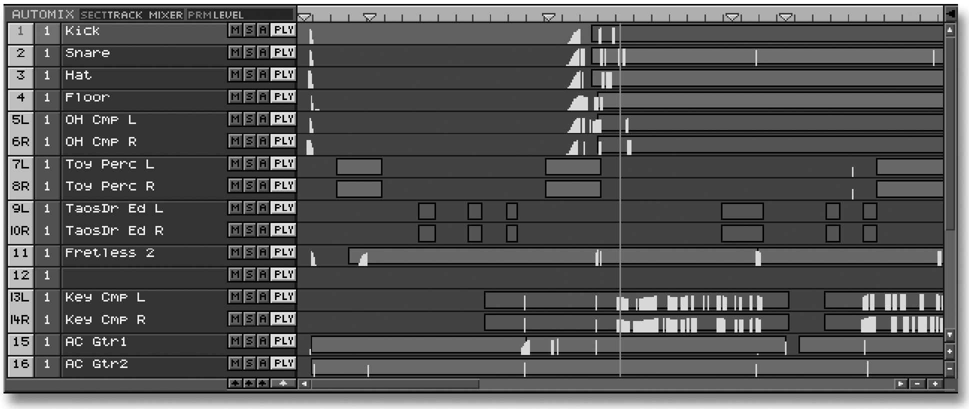
Recording Bus Attenuation

The REC BUS ATT knob in the OUTPUT ASSIGN pane allows you to adjust your listening level when you're directly monitoring the 16 recording busses, as described on Page 273.

REC
BUS
ATT
- 6.0

35—VGA Main Display Automix Editing

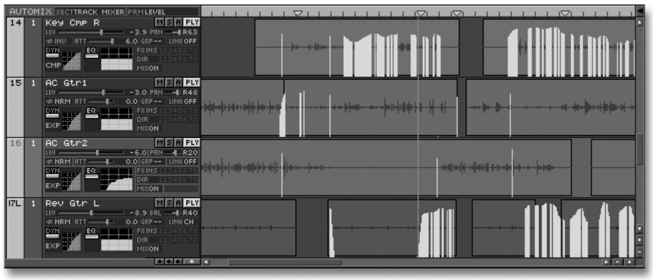
The VGA main display provides its own Automix editing screen in which you can refine recorded Automix data, create new data or delete data while viewing the corresponding track audio waveforms. To display the Automix editing screen, select AUTOMIX EDIT from the onscreen UTILITIES menu.


AUTOMIX
SECT TRACK MIXER PRM LEVEL
1 1 Kick
2 1 Snare
3 1 Hat
4 1 Floor
5L 1 OH Cmp L
6R 1 OH Cmp R
7L 1 Toy Perc L
8R 1 Toy Perc R
9L 1 TaosDr Ed L
10R 1 TaosDr Ed R
11 1 Fretless 2
12 1
13L 1 Key Cmp L
14R 1 Key Cmp R
15 1 AC Gtr1
16 1 AC Gtr2
M S A PLY

Editing Automix Data on the VGA

The VGA Automix editing screen's operation and tools are essentially the same as those found in the internal LCD's AUTOMIX EDIT window, described on Page 320. As on the LCD, Automix editing is a lot like track audio region editing. The MICRO EDIT screen (Page 327) provide more detailed Automix data editing capabilities.

When you're editing track channel Automix tracks, you can view the corresponding track audio by zooming in to display four or two tracks.


AUTOMIX
SECT TRACK MIXER PRM LEVEL
14 1 Key Cmp R
15 1 AC Gtr1
16 1 AC Gtr2
17L 1 Rev Gtr L
M S A PLY

To learn about recording Automix data, see "Recording Automix Data" on Page 317.

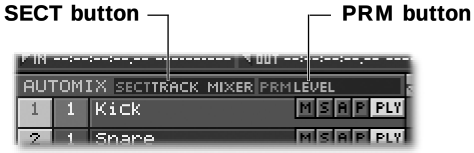
You can record up to nine separate Automixes in each project, as described on Page 315.

Targeting Automix Tracks and Data for Editing

The Automix editing screen's F1 (TARGET) button opens up the TARGET SELECT window (Page 321). In this window, you can select to display and edit:

- *the desired type of Automix tracks*—You can view input channel, track channel, FX return channel, effect processor, MASTER bus, Aux bus or Direct path Automix tracks.
- *the desired type of Automix data*—You can display and edit the Automix data for any of the selected Automix track's automatable parameters.

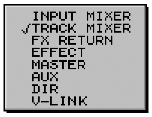
The VGA's Automix editing screen gives you a faster way to get to and select the desired editing target Automix tracks and data: the SECT and PRM buttons, located just above the displayed tracks' names.


SECT button
PRM button
AUTOMIX
SECT TRACK MIXER
PRM LEVEL
1 1 Kick
M S A P PLY
2 1 Snare
M S A P PLY

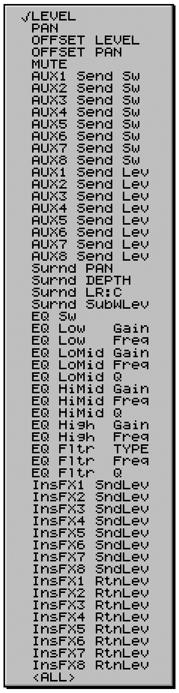
To display and edit:

- *the desired type of Automix tracks*—click the SECT button and choose the desired set of Automix tracks from the pop-up menu.
- *the desired type of Automix data*—click the PRM button to choose the type of Automix data you want to edit. The menu shows all of the parameters that can be automated for the selected type of Automix track.

SECT pop-up menu


INPUT MIXER
√TRACK MIXER
FX RETURN
EFFECT
MASTER
AUX
DIR
V-LINK

PRM pop-up menu for track channel Automix tracks


√LEVEL
PAN
OFFSET LEVEL
OFFSET PAN
MUTE
AUX1 Send Sw
AUX2 Send Sw
AUX3 Send Sw
AUX4 Send Sw
AUX5 Send Sw
AUX6 Send Sw
AUX7 Send Sw
AUX8 Send Sw
AUX1 Send Lev
AUX2 Send Lev
AUX3 Send Lev
AUX4 Send Lev
AUX5 Send Lev
AUX6 Send Lev
AUX7 Send Lev
AUX8 Send Lev
Surnd PAN
Surnd DEPTH
Surnd LR:C
Surnd SubWLev
EQ Sw
EQ Low Gain
EQ Low Freq
EQ LoMid Gain
EQ LoMid Freq
EQ LoMid Q
EQ HiMid Gain
EQ HiMid Freq
EQ HiMid Q
EQ High Gain
EQ High Freq
EQ Fltr TYPE
EQ Fltr Freq
EQ Fltr Q
InsFX1 SndLev
InsFX2 SndLev
InsFX3 SndLev
InsFX4 SndLev
InsFX5 SndLev
InsFX6 SndLev
InsFX7 SndLev
InsFX8 SndLev
InsFX1 RtnLev
InsFX2 RtnLev
InsFX3 RtnLev
InsFX4 RtnLev
InsFX5 RtnLev
InsFX6 RtnLev
InsFX7 RtnLev
InsFX8 RtnLev
<ALL>

Supplemental Information

R-BUS Remote Control

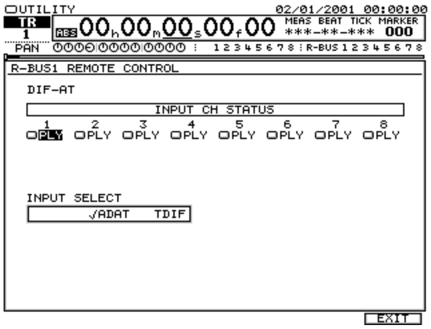
You can remotely control a variety of connected R-BUS devices right from the VS-2400CD. To learn how to activate remote control of an R-BUS device, see Page 369. The following sections describe the parameters in each device that you can set from the VS-2400CD.

To leave any of the remote control screens described in these sections—and return to the VS-2400CD's R-BUS CONFIG screen—press F6 (EXIT).

The parameters discussed in the following sections appear on the VS-2400CD's R-BUS screen only when remote control of the respective device has been activated, as described on Page 369.

When you've connected an RPC-1 card to the VS-2400CD's R-BUS jack, disable remote control of that R-BUS jack.

DIF-AT Settings



R-BUS1 REMOTE CONTROL

DIF-AT

INPUT CH STATUS

1	2	3	4	5	6	7	8
PLY	PLY	PLY	PLY	PLY	PLY	PLY	PLY

INPUT SELECT: ✓ADAT TDIF

INPUT CH STATUS 1-8

You can set the status of each track on the connected recorder connected to the DIF-AT. You can choose:

- *PLY*—to set the track so that it plays back any audio recorded on the track.
- *REC*—to arm the track for recording.

INPUT SELECT

INPUT SELECT chooses the desired type of digital recorder. You can select:

- *ADAT*—to use the DIF-AT with an ADAT-format recorder.
- *TDIF*—to use the DIF-AT with a T-DIF-format recorder.

Using a Roland DIF-AT

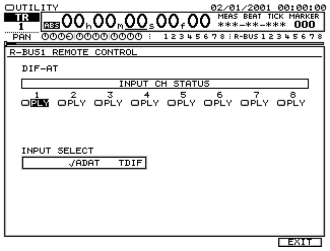
With an ADAT

With a Roland DIF-AT, audio can be digitally exchanged between the VS-2400CD and an ADAT recorder, controlling the ADAT from the VS-2400CD.

1. With the power to all devices turned off, connect the ADAT to the DIF-AT, and the DIF-AT to the VS-2400CD.

Connect the ADAT's SYNC IN connector to the SYNC connector on the DIF-AT. This connection is required for controlling the ADAT remotely from the VS-2400CD/DIF-AT, and to transmit MTC from the DIF-AT.

2. Turn on the ALESIS ADAT, and then turn on the VS-2400CD.
3. Hold down SHIFT and press F4•UTILITY.
4. Press PAGE until "R-BUS" appears above F1.
5. Press F1 (R-BUS)—the R-BUS CONFIG screen appears (Page 369).
6. Activate remote control of the VS-2400CD's R-BUS jack.
7. Press the F1 (R-BUS) to display the DIF-AT's settings.
8. Set INPUT SELECT to ADAT.
9. Press F6 (EXI).
10. Press PAGE until "Proj" appears above F3.
11. Press F3 (Proj)—the PROJECT PARAMETER screen appears.
12. Set MASTER CLOCK to INT.
13. Press F6 (EXIT).
14. Press F5 (MIDI)—the display switches to the MIDI PARAMETER screen.
15. Set MMC MODE to MASTER.
16. Press F6 (EXIT).
17. Press F6 (SYNC)—the SYNC PARAMETER screen appears.
18. Set SYNC MODE to EXT and set the EXT SYNC SOURCE parameter to R-BUS.



INPUT SELECT
✓ADAT TDIF

With a TASCAM DA Series Device

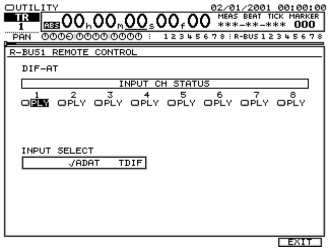
With a Roland DIF-AT, audio can be digitally exchanged between the VS-2400CD and a DA Series—T-DIF—device, with the VS-2400CD being controlled by the DA Series device.

A TASCAM DA Series device's word clock cannot be slaved to the VS-2400CD. It must provide the master word clock for both devices.

1. With the power to all devices turned off, connect the DA series device to the DIF-AT, and the DIF-AT to the VS-2400CD.

Connect the DA Series device's SYNC IN connector to the SYNC connector on the DIF-AT—its SYNC OUT connector *cannot* be connected to the DIF-AT.

2. Turn on the TASCAM DA Series device, and then turn on the VS-2400CD.
3. Hold down SHIFT and press F4•UTILITY.
4. Press PAGE until "R-BUS" appears above F1.
5. Press F1 (R-BUS)—the R-BUS CONFIG screen appears (Page 369).
6. As described on Page 369, activate remote control of the VS-2400CD's R-BUS jack.



UTILITY 02/01/2001 00:00:00
TR 1 ABS 00h00m00s00f00 MEAS BEAT TICK MARKER ***-**-*** 000
PAN 1 2 3 4 5 6 7 8 : R-BUS 1 2 3 4 5 6 7 8

R-BUS1 REMOTE CONTROL

DIF-AT

INPUT CH STATUS

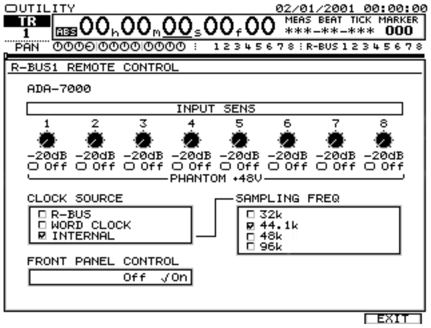
1 ○PLY 2 ○PLY 3 ○PLY 4 ○PLY 5 ○PLY 6 ○PLY 7 ○PLY 8 ○PLY

INPUT SELECT

√ADAT TDIF

7. Press the F1 (R-BUS) to display the DIF-AT's settings.
8. Set INPUT SELECT to TDIF.
9. Press F6 (EXIT).
10. Press PAGE until "Proj" appears above F3.
11. Press F3 (Proj)—the PROJECT PARAMETER screen appears.
12. Set MASTER CLOCK to the R-BUS jack.
13. Press F6 (EXIT).
14. Press F5 (MIDI) to display the MIDI PARAMETER screen.
15. Set MMC MODE to MASTER.
16. Press F6 (EXIT).
17. Press F6 (SYNC)—the SYNC PARAMETER screen appears.
18. Set SYNC MODE to EXT and set the EXT SYNC SOURCE parameter to R-BUS.

ADA-7000 Settings



UTILITY 02/01/2001 00:00:00
TR 1 ABS 00h00m00s00f00 MEAS BEAT TICK MARKER ***-**-*** 000
PAN 1 2 3 4 5 6 7 8 : R-BUS 1 2 3 4 5 6 7 8

R-BUS1 REMOTE CONTROL

ADA-7000

INPUT SENS

1 -20dB ○ Off
2 -20dB ○ Off
3 -20dB ○ Off
4 -20dB ○ Off
5 -20dB ○ Off
6 -20dB ○ Off
7 -20dB ○ Off
8 -20dB ○ Off

PHANTOM +48V

CLOCK SOURCE
☐ R-BUS
☐ WORD CLOCK
☑ INTERNAL

SAMPLING FREQ
☐ 32k
☑ 44.1k
☐ 48k
☐ 96k

FRONT PANEL CONTROL
Off √On

INPUT SENS 1-8

Each INPUT SENS parameter sets the input sensitivity of the corresponding ADA-7000 input jack—changing a parameter's value is the same thing as turning the corresponding input sensitivity knob on the front panel of the ADA-7000.

FRONT PANEL CONTROL

You can disable front-panel control of the ADA-7000 so that it can be set only from the the VS-2400CD. To do this turn FRONT PANEL CONTROL off. If you want to retain control of the ADA-7000 in both places, leave FRONT PANEL CONTROL on.

When front-panel control of the ADA-7000 is turned on, the values reflect by the position of its knobs may not agree with its actual current values, as shown on its R-BUS REMOTE CONTROL screen.

PHANTOM +48V 1-8

Turn on an input jack's PHANTOM +48V 1-8 when you need to supply phantom power to a condenser mic connected to the input.

Turn a jack's phantom power on only when the device—typically a condenser mic—connected to the jack requires phantom power. Activating phantom power when other devices are connected to the jack may result in damage to the connected device.

CLOCK SOURCE

CLOCK SOURCE selects the master clock timing reference for the ADA-7000. This parameter interacts with the VS-2400CD's MASTER CLOCK parameter (Page 128).

- When the VS-2400CD's MASTER CLOCK parameter's value is R-BUS, the ADA-7000's CLOCK SOURCE should be set to INTERNAL or WORD CLOCK.
- When the VS-2400CD MASTER CLOCK is set to INT, DIGITAL IN or EXT TIME CODE, the ADA-7000's CLOCK SOURCE should be set to R-BUS.

Turn down the volume for all connected equipment before changing the CLOCK SOURCE value to avoid damage to your equipment.

The following table explains the CLOCK SOURCE values and tells you how to set the VS-2400CD's MASTER CLOCK parameter with each ADA-7000 CLOCK SOURCE value.

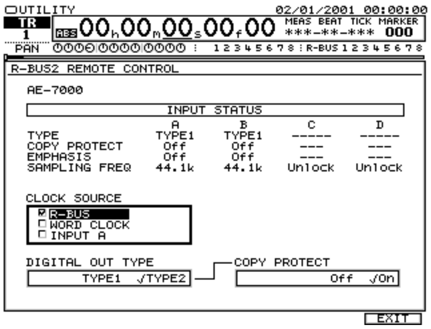
If the ADA-7000 CLOCK SOURCE is:	*This means that the ADA-7000:*	*Set the VS-2400CD's MASTER CLOCK to:*
INTERNAL	uses its own master clock and sample rate (see "SAMPLING FREQ" below).	R-BUS.
WORD CLOCK	derives its clocking from the word clock device connected to its rear-panel WORD CLOCK jack.	R-BUS.
R-BUS	derives master clock from the VS-2400CD.	a clock source other than R-BUS.

SAMPLING FREQ

SAMPLING FREQ provides a readout of the sample rate at which the ADA-7000 is operating and capturing audio through its input jacks. When the ADA-7000's CLOCK SOURCE parameter is set to INTERNAL, SAMPLING FREQ automatically switches to the current project's sample rate, unless the project uses the 88.2k or 64k sample rates—the ADA-7000 doesn't support the use of these two sample rates.

When the ADA-7000's CLOCK SOURCE is set to any value other than INTERNAL, it derives its sample rate from the selected master clock source.

AE-7000 Settings



R-BUS2 REMOTE CONTROL

AE-7000

INPUT STATUS

	A	B	C	D
TYPE	TYPE1	TYPE1	-----	-----
COPY PROTECT	Off	Off	---	---
EMPHASIS	Off	Off	---	---
SAMPLING FREQ	44.1k	44.1k	Unlock	Unlock

CLOCK SOURCE
☑ R-BUS
☐ WORD CLOCK
☐ INPUT A

DIGITAL OUT TYPE: TYPE1 √TYPE2
COPY PROTECT: Off √On

INPUT STATUS A-D

The INPUT STATUS display provides information about input signals received by the AE-7000’s A/D input converters. There are four kinds of information displayed regarding each of the four inputs, A, B, C and D. The displayed information is explained in the following sections.

TYPE

Shows the format of the received digital audio:

- *TYPE1*—is AES/EBU-format digital audio.
- *TYPE2*—is IEC 60958-format digital audio.
- *“--”*—means that there’s no input signal.

COPY PROTECT

COPY PROTECT reveals the presence of SCMS copy-protection in the input signal.

- *On*—means that SCMS copy-protection data is present in the input signal.
- *Off*—means that no SCMS copy-protection data is present in the input signal.
- *“--”*—means that there’s no input signal.

EMPHASIS

Emphasis boosts the high-frequency content of digital audio signals. If EMPHASIS is:

- *On*—emphasis signals are present in the digital audio.
- *Off*—there’s no emphasis applied to the digital audio.
- *“--”*—means that there’s no input signal.

SAMPLING FREQ

SAMPLING FREQ shows the sample rate of the received digital audio, from 32k to 48k. “Unlock” is displayed if:

- there’s no signal.
- the signals are outside the supported sample frequency range.
- there’s no master clock

CLOCK SOURCE

CLOCK SOURCE selects the master clock timing reference for the AE-7000. This parameter interacts with the VS-2400CD’s MASTER CLOCK parameter (Page 128).

- When the VS-2400CD’s MASTER CLOCK parameter’s value is R-BUS, the AE-7000’s CLOCK SOURCE should be set to INPUT A or WORD CLOCK.
- When the VS-2400CD MASTER CLOCK is set to INT, DIGITAL IN or EXT TIME CODE, the AE-7000’s CLOCK SOURCE should be set to R-BUS.

Turn down the volume for all connected equipment before changing the CLOCK SOURCE value to avoid damage to your equipment.

The following table explains the CLOCK SOURCE values and tells you how to set the VS-2400CD’s MASTER CLOCK parameter with each AE-7000 CLOCK SOURCE value.

If the AE-7000's CLOCK SOURCE is:	*This means that the AE-7000:*	*Set the VS-2400CD's MASTER CLOCK to:*
R-BUS	derives master clock from the VS-2400CD.	a clock source other than R-BUS.
WORD CLOCK	derives its clocking from the word clock device connected to its rear-panel WORD CLOCK jack.	R-BUS.
INPUT A	uses the master clock received by its INPUT A jack.	R-BUS.

DIGITAL OUT TYPE

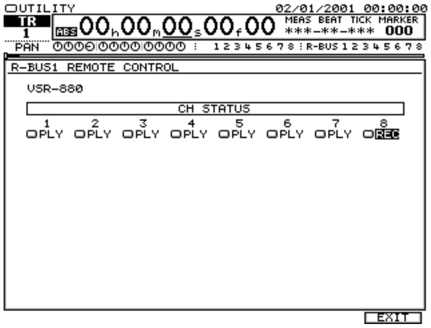
This parameter selects the type of digital audio signals to be output from the AE-7000. You can select:

- *TYPE1*—to produce digital audio that conforms to AES/EBU standards for use by professional broadcast and recording studios. Use this setting if you wish to send digital audio from the VS-2400CD to a ProTools™ system.
- *TYPE2*—to produce IEC 60958 digital audio for devices such as DAT and MiniDisc recorders.

COPY PROTECT

When COPY PROTECT is on, SCMS copy-protection is embedded in IEC 60958 digital audio transmitted from the AE-7000—to transmit this type of audio, TYPE2 must be selected as the DIGITAL OUT TYPE (see above). This copy-protection prevents the creation of further copies of the digital audio. To disable copy-protection, turn COPY PROTECT off.

VSR-880 Settings



VSR-880

CH STATUS

1	2	3	4	5	6	7	8
PLY	PLY	PLY	PLY	PLY	PLY	PLY	REC

CH STATUS 1-8

You can set the status of each track on an R-BUS-connected VSR-880. You can choose:

- *SRC*—to listen to the track's source signal.
- *PLY*—to set the track so that it plays back any audio recorded on the track.
- *REC*—to arm the track for recording.
- *MUT*—to turn the track off.

Using the VS-2400CD with a VM-7000 Mixing System

You can transfer audio between a VS-2400CD and an R-BUs equipped Roland VM-7000 mixing system.

To add R-BUS connectivity to a VM mixing system, install a VM-24E I/O expansion board—purchased separately—in your master processor for 24 channels of digital I/O.

1. With all devices turned off, use an R-BUS cable to connect a VM-7000 R-BUS connector to a VS-2400CD R-BUS connector.
2. Turn on the VM-7000, and then the VS-2400CD.

Setting Up the VS-2400CD

1. Hold down SHIFT and press F4•UTILITY.
2. If "Proj" isn't visible above F3, press PAGE until it is.
3. Press F3 (Proj)—the PROJECT PARAMETER screen appears.
4. Set MASTER CLOCK to INT.
5. Press F6 (EXIT).
6. Press F5 (MIDI)—the MIDI PARAMETER screen appears.
7. Set MMC MODE to SLAVE and MMC SOURCE to R-BUS.
8. Press F6 (EXIT).
9. Press F6 (SYNC) to display the SYNC PARAMETER screen.
10. Set SYNC MODE to INT.
11. Set the SYNC Gen. parameter to R-BUS.
12. Set FRAME RATE to the same frame rate the VM-7000's using. Unless you have a reason to select another frame rate, use 30 fps since it offers the fastest available continuous time code.

Setting Up the VM-7200/VM-7100

1. Hold down SHIFT and press PROJECT.
2. Press ▼ if necessary to select the row of icons containing DIGITAL I/O.
3. Press F1 (DIGITAL I/O).
4. Set:
    - WORD CLOCK SOURCE to the R-BUS jack to which the VS-2400CD's connected. If the VS-2400CD's connected to the VM-7000's first R-BUS jack, select MULTI 1-8. If it's connected to its second R-BUS jack, select MULTI 9-16. If it's connected to its third R-BUS jack, choose MULTI 17-24.
    - INTERNAL SAMPLING RATE to the VS-2400CD project's sample rate.
5. Hold down SHIFT and press PROJECT.
6. Press F3 (SYNC CLOCK).
7. Set:
    - SYNC MASTER to EXT and the R-BUS jack to which the VS-2400CD's connected (see Step 4 above).
    - FRAME TYPE to the VS-2400CD's frame rate.
    - MMC MASTER to INT
    - MACHINE TYPE to HD.

You can now send audio in either direction between the two devices and control the VS-2400CD's transport from the VM-7000 console.

Using a Roland VE-7000

The optional Roland VE-7000 Channel Edit Controller provides physical knobs and buttons with which you can quickly edit any input, track or FX return channel's CH EDIT parameters. These parameters are explained in detail in Chapters 11 and 17.

Connecting the VE-7000

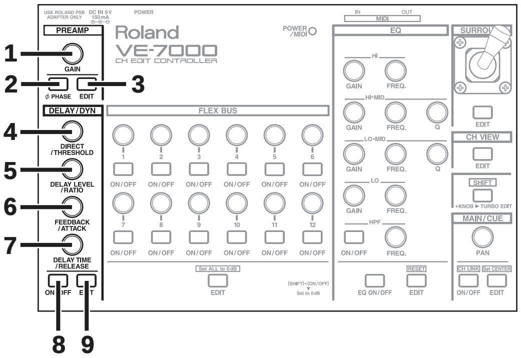
1. With the power to all devices turned off, connect the VS-2400CD's MIDI IN to the VE-7000's MIDI OUT using a MIDI cable.
2. Turn on the power to the devices.

Using the VE-7000

The following sections list the CH EDIT parameters associated with each knob and button on the VE-7000, grouped as they are on the VE-7000's front panel. These parameters are explained in detail in Chapters 11 and 17.

Press the desired channel's CH EDIT button to set its CH EDIT parameters with the VE-7000.

PREAMP, DELAY/DYN Areas


1
2
3
4
5
6
7
8
9
PREAMP
GAIN
PHASE
EDIT
DELAY/DYN
DIRECT /THRESHOLD
DELAY LEVEL /RATIO
FEEDBACK /ATTACK
DELAY TIME /RELEASE
ON/OFF
EDIT
Roland
VE-7000
CH EDIT CONTROLLER
POWER /MIDI
FLEX BUS
EQ
HI
HI-MID
LO-MID
LO
HPF
GAIN
FREQ.
Q
SURROUND
CH VIEW
SHIFT
MAIN/CUE
PAN
EQ ON/OFF

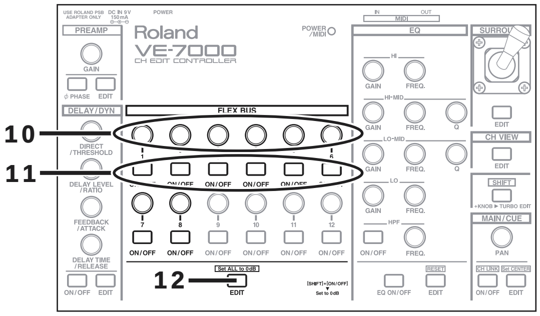
Preamp Area

VE-7000 knob or button:	*Acts as CH EDIT parameter or F button:*
1. GAIN	ATT
2. PHASE	PHASE on/off switch
3. EDIT	Displays CH EDIT VIEW screen

DELAY/DYN Area

VE-7000 knob or button:	*Same as CH EDIT parameter or F button:*
4. DIRECT/THRESHOLD	DYN screen Threshold
5. DELAY LEVEL/RATIO	DYN screen Ratio
6. FEEDBACK/ATTACK	DYN screen Attack
7. DELAY TIME/RELEASE	DYN screen Release
8. ON/OFF	Dynamics processor on/off switch
9. EDIT	Displays DYN screen

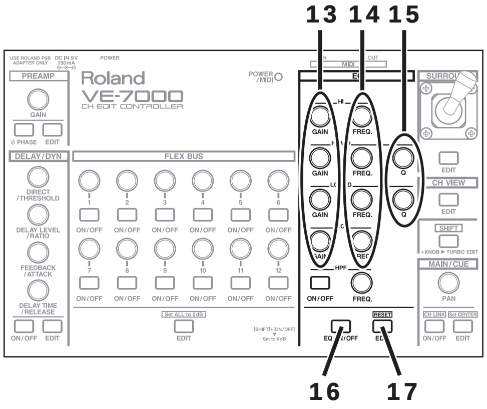
FLEX BUS Area


10
11
12
Roland
VE-7000
CH EDIT CONTROLLER
PREAMP
GAIN
PHASE
EDIT
DELAY/DYN
DIRECT /THRESHOLD
DELAY LEVEL /RATIO
FEEDBACK /ATTACK
DELAY TIME /RELEASE
FLEX BUS
ON/OFF
Set ALL to 0dB
EDIT
EQ
SURROUND
CH VIEW
SHIFT
MAIN/CUE
PAN

VE-7000 knob or button:	*Same as CH EDIT parameter or F button:*
10. 1-8 Knobs	Corresponding AUX Send Levels 1-8
11. 1-8 ON/OFF	Corresponding AUX Send Status
12. EDIT (Set ALL to 0dB)	Displays CH EDIT VIEW screen, Aux send selected

Hold SHIFT and press 1-8 ON/OFF to set the corresponding Send Level to 0 dB. Hold SHIFT and press Set ALL to 0dB (EDIT) to set all Aux Send Levels to 0 dB.

EQ Area

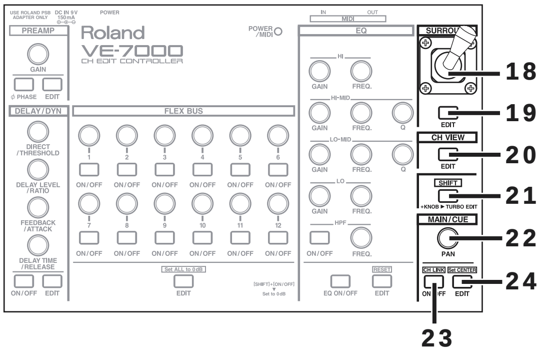

13
14
15
16
17
Roland
VE-7000
CH EDIT CONTROLLER
GAIN
FREQ.
Q
HPF
ON/OFF
EQ ON/OFF
EDIT
RESET
FLEX BUS
SURROUND
CH VIEW
SHIFT
MAIN/CUE
PAN

VE-7000 knob or button:	*Same as CH EDIT parameter or F button:*
13. HI/HI-MID/LO-MID/LO GAIN	Corresponding EQ band gain
14. HI/HI-MID/LO-MID/LO FREQ.	Corresponding EQ band frequency
15. HI-MID/LO-MID Q	Hi-mid and lo-mid EQ band Q
16. EQ ON/OFF	EQ on or off
17. EDIT (RESET)	Displays EQ screen

Hold down SHIFT as you turn an EQ HI/HI-MID/LO-MID/LO FREQ knob to change values by larger increments.

Hold down SHIFT and press RESET (EDIT) to reset the EQ to its default values.

SURROUND, CH VIEW, MAIN CUE Areas



Hold down SHIFT as you turn a VE-7000 knob to activate its TURBO EDIT feature. When TURBO EDIT is turned on, a knob scrolls through values in smaller or larger increments, depending on the parameter.

SURROUND Area

VE-7000 knob or button:	*Acts as CH EDIT parameter or F button:*
18. Joystick	Surround pan and depth
19. EDIT	F2 (Surrnd)

CH VIEW Area

VE-7000 knob or button:	*Same as CH EDIT parameter or F button:*
20. EDIT	CH EDIT button—displays CH EDIT VIEW screen
21. SHIFT	Performs same function as VS-2400CD SHIFT button

MAIN/CUE Area

VE-7000 knob or button:	*Same as CH EDIT parameter or F button:*
22. PAN	PAN
23. ON/OFF	MIX on/off switch
24. EDIT (Set CENTER)	Displays CH EDIT VIEW screen, PAN selected

Hold SHIFT and press MAIN/CUE EDIT•Set CENTER to set PAN to its C (center) value.

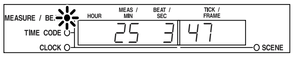
Hold SHIFT and press MAIN/CUE ON/OFF•CH LINK to link or un-link the currently selected channel with its odd/even partner.

Roland MB-24 Notes

The optional MB-24 Level Meter Bridge adds a full-sized meter array to your VS-2400CD. To learn how to connect an MB-24 to your VS-2400CD, see Page 375. "EXT LEVEL METER (MB-24)" on Page 352 explains how to configure the MB-24 for use with the VS-2400CD.

When used with the VS-2400CD, the MB-24 does not use its PRE EQ, SECTION (1st UNIT/2nd UNIT), MULTI OUT, FLEX BUS, MULTI IN, INPUT, DIM," or TALKBACK indicators. Also, you may occasionally notice that PRE EQ and 1st UNIT light immediately after the MB-24 is turned on. This does not indicate a malfunction.

The MB-24's tick indicator—when the TIME DISPLAY parameter is set to MEASURE/BEAT—shows one-tenth the actual number of ticks since there are only two digits available for this purpose, as shown here.

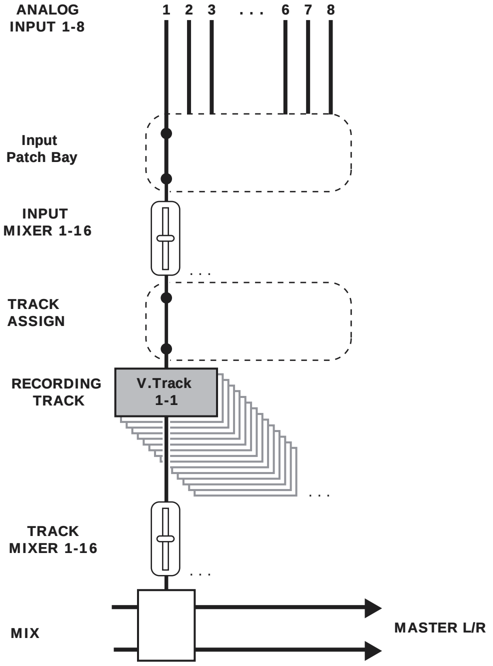


For Measure 29, Beat 3, Ticks 470-479 are shown as simply Tick 47.

Factory EZ Routing Templates

The VS-2400CD ships with seven EZ Routing templates—see Page 282 for information on EZ Routing templates. The settings contained in the factory templates are as follows.

Recording Template


ANALOG INPUT 1-8
1 2 3 . . . 6 7 8
Input Patch Bay
INPUT MIXER 1-16
TRACK ASSIGN
RECORDING TRACK
V.Track 1-1
TRACK MIXER 1-16
MIX
MASTER L/R

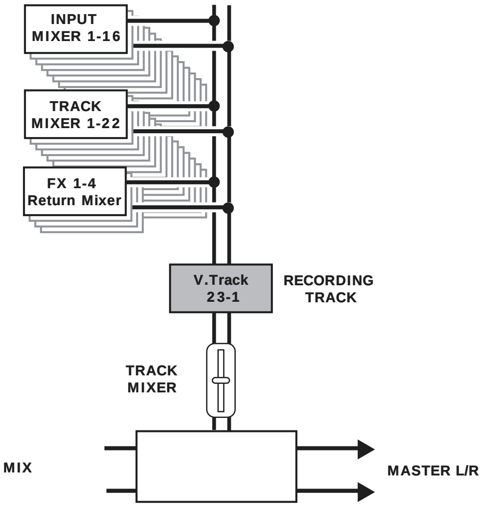
Patch Bay:	*Input Mixer:*	*Recording Track:*
ANALOG INPUT 1	1	1
:	:	:
ANALOG INPUT 8	8	8

OUTPUT ASSIGN:	
Track Direct Out	*Off*

LINK:	
Ch Link	Off (IN1–16, TR1–16)

TRACK STATUS:	
TR1	REC
:	:
TR16	REC
TR17	Off
:	:
TR24	Off

Bouncing Template


INPUT MIXER 1-16
TRACK MIXER 1-22
FX 1-4 Return Mixer
V.Track 23-1
RECORDING TRACK
TRACK MIXER
MIX
MASTER L/R

TRACK ASSIGN:	
IN1	To bounce track*
:	:
IN16	To bounce track*
TR1	To bounce track*
:	:
TR22	To bounce track*
To bounce track*	Cannot be assigned
FX1 RTN	To bounce track*
:	:
FX4 RTN	To bounce track*
AUX1	Not in Use
:	:
AUX8	Not in Use
DIR1	Not in Use
:	:
DIR8	Not in Use

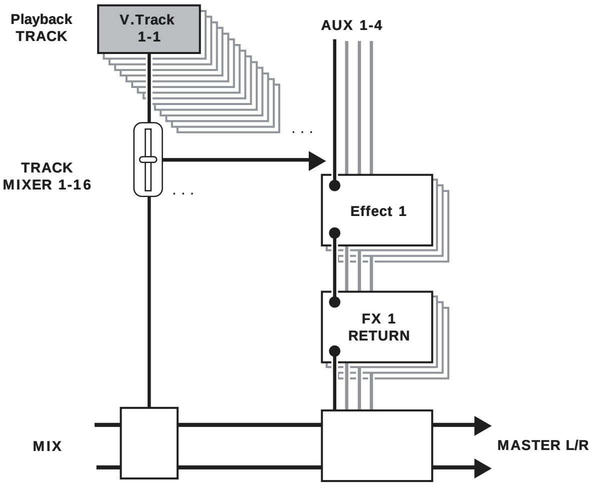
OUTPUT ASSIGN:	
Track Direct Out	Off

TRACK STATUS:	
TR1	PLAY
:	:
TR22	PLAY
Bounce Track *	REC

**Bounce destination tracks are:*

- *TR 23/24*—MTP, MT1, MT2, LIV or LV2, and a sample rate of 48k or lower
- *TR 15/16*—M24, M16 or CDR, and a sample rate of 48k or lower
- *TR 11/12*—MTP, MT1, MT2, LIV or LV2, and a sample rate of 64k or higher
- *TR 7/8*—M24, M16 or CDR, and a sample rate of 64k or higher

Mixdown Template

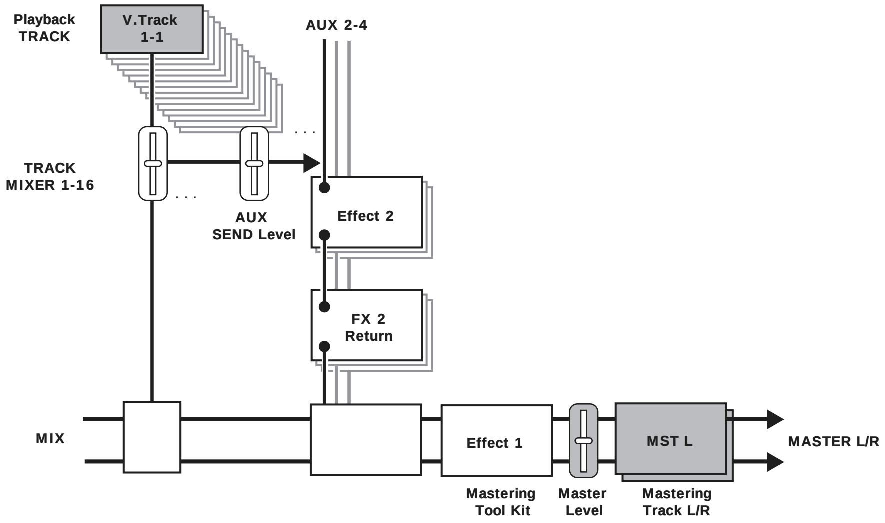

Playback
TRACK
V.Track
1-1
AUX 1-4
TRACK
MIXER 1-16
Effect 1
FX 1
RETURN
MIX
MASTER L/R

TRACK ASSIGN:	
IN1	Not in Use
:	:
IN16	Not in Use
FX1 RTN	Not in Use
:	:
FX4 RTN	Not in Use
AUX1	Not in Use
:	:
AUX8	Not in Use
DIR1	Not in Use
:	:
DIR8	Not in Use

OUTPUT ASSIGN:	
Track Direct Out	Off

TRACK STATUS:	
TR1	PLAY
:	:
TR24	PLAY

Mastering Template


Playback TRACK
V.Track 1-1
AUX 2-4
TRACK MIXER 1-16
AUX SEND Level
Effect 2
FX 2 Return
MIX
Effect 1
MST L
MASTER L/R
Mastering Tool Kit
Master Level
Mastering Track L/R

TRACK ASSIGN:	
IN1	Not in Use
:	:
IN16	Not in Use
TR1	Not in Use
:	:
TR24	Not in Use
FX1 RTN	Not in Use
:	:
FX4 RTN	Not in Use
AUX1	Not in Use
:	:
AUX8	Not in Use
DIR1	Not in Use
:	:
DIR8	Not in Use

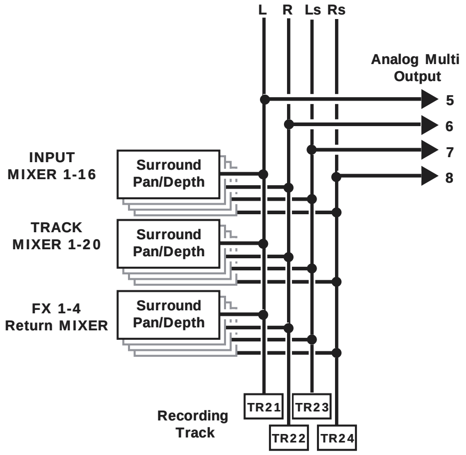
OUTPUT ASSIGN:	
Track Direct Out	Off

TRACK STATUS:	
TR1	PLAY
:	:
TR24	PLAY

Others:	
MASTERING Sw	On

Others:	
MASTERING MODE	Rec
FX1 Patch	P231:MTK:Mixdown

Surround 2+2 Template


L
R
Ls
Rs
Analog Multi Output
5
6
7
8
INPUT MIXER 1-16
Surround Pan/Depth
TRACK MIXER 1-20
Surround Pan/Depth
FX 1-4 Return MIXER
Surround Pan/Depth
Recording Track
TR21
TR22
TR23
TR24

Surround Mix Mode
2+2

TRACK ASSIGN:	
IN1	Not in Use
:	:
IN16	Not in Use
TR1	Not in Use
:	:
TR24	Not in Use
FX1 RTN	Not in Use
:	:
FX4 RTN	Not in Use
AUX1	Not in Use
:	:
AUX4	Not in Use
L (AUX 5)	Record Track A*
R (AUX 6)	Record Track B*
Ls (AUX 7)	Record Track C*
Rs (AUX 8)	Record Track D*
DIR1	Not in Use
:	:
DIR8	Not in Use

OUTPUT ASSIGN:	
Track Direct Out	Off

LINK:	
Bus LINK	Off (AUX 4-8)

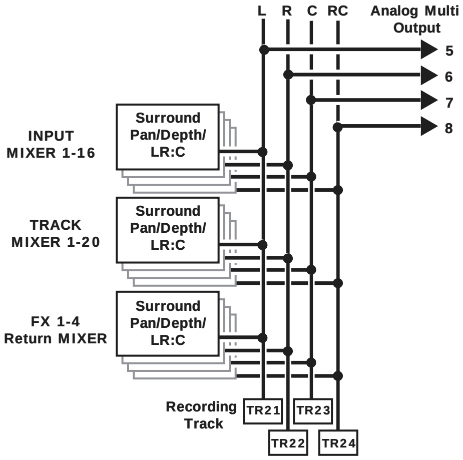
TRACK STATUS:	
TR1	PLAY
:	:
TR24	PLAY
Record track*	REC

Others:	
SURROUND MIX Sw	On
SURROUND MIX MODE	2+2

**Recording tracks are:*

- *TR 21/22/23/24*—MTP, MT1, MT2, LIV or LV2, and a sample rate of 48k or lower
- *TR 13/14/15/16*—M24, M16 or CDR, and a sample rate of 48k or lower
- *TR 9/10/11/12*—MTP, MT1, MT2, LIV or LV2, and a sample rate of 64k or higher
- *TR 5/6/7/8*—M24, M16 or CDR, and a sample rate of 64k or higher

Surround 3+1 Template


L
R
C
RC
Analog Multi Output
5
6
7
8
INPUT MIXER 1-16
Surround Pan/Depth/ LR:C
TRACK MIXER 1-20
Surround Pan/Depth/ LR:C
FX 1-4 Return MIXER
Surround Pan/Depth/ LR:C
Recording Track
TR21
TR23
TR22
TR24

Surround Mix Mode
3+1

TRACK ASSIGN:	
IN1	Not in Use
:	:
IN16	Not in Use
TR1	Not in Use
:	:
TR24	Not in Use
FX1 RTN	Not in Use
:	:
FX4 RTN	Not in Use

TRACK ASSIGN:	
AUX1	Not in Use
:	:
AUX4	Not in Use
L (AUX 5)	Record Track A*
R (AUX 6)	Record Track B*
C (AUX 7)	Record Track C*
RC (AUX 8)	Record Track D*
DIR1	Not in Use
:	:
DIR8	Not in Use

OUTPUT ASSIGN:	
Track Direct Out	Off

LINK:	
Bus LINK	Off (AUX 4-8)

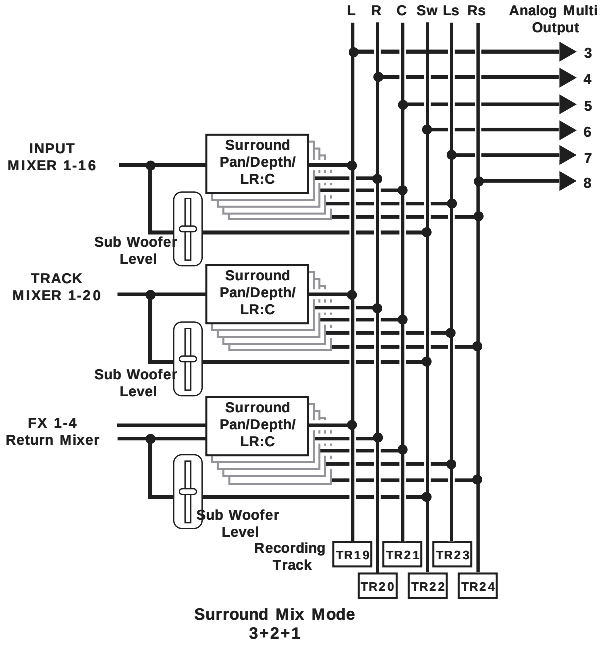
TRACK STATUS:	
TR1	PLAY
:	:
TR24	PLAY
Record track*	REC

Others:	
SURROUND MIX Sw	On
SURROUND MIX MODE	3+1

**Recording tracks are:*

- *TR 21/22/23/24*—MTP, MT1, MT2, LIV or LV2, and a sample rate of 48k or lower
- *TR 13/14/15/16*—M24, M16 or CDR, and a sample rate of 48k or lower
- *TR 9/10/11/12*—MTP, MT1, MT2, LIV or LV2, and a sample rate of 64k or higher
- *TR 5/6/7/8*—M24, M16 or CDR, and a sample rate of 64k or higher

Surround 3+2+1 Template


L
R
C
Sw
Ls
Rs
Analog Multi Output
3
4
5
6
7
8
INPUT MIXER 1-16
Surround Pan/Depth/ LR:C
Sub Woofer Level
TRACK MIXER 1-20
Surround Pan/Depth/ LR:C
Sub Woofer Level
FX 1-4 Return Mixer
Surround Pan/Depth/ LR:C
Sub Woofer Level
Recording Track
TR19
TR21
TR23
TR20
TR22
TR24
Surround Mix Mode 3+2+1

TRACK ASSIGN:	
IN1	Not in Use
:	:
IN16	Not in Use
TR1	Not in Use
:	:
TR24	Not in Use
FX1 RTN	Not in Use
:	:
FX4 RTN	Not in Use
AUX1	Not in Use
AUX2	Not in Use
L (AUX 3)	Record Track A*
R (AUX 4)	Record Track B*
C (AUX 5)	Record Track C*
Sw (AUX 6)	Record Track D*
Ls (AUX 7)	Record Track E*
Rs (AUX 8)	Record Track F*
DIR1	Not in Use
:	:
DIR8	Not in Use

OUTPUT ASSIGN:	
Track Direct Out	Off

LINK:	
Bus LINK	Off (AUX 2-8)

TRACK STATUS:	
TR1	PLAY
:	:
TR24	PLAY
Record track*	REC

Others:	
SURROUND MIX Sw	On
SURROUND MIX MODE	3+2+1

**Recording tracks are:*

- *TR 19/2021/22/23/24*—MTP, MT1, MT2, LIV or LV2, and a sample rate of 48k or lower
- *TR 11/12/13/14/15/16*—M24, M16 or CDR, and a sample rate of 48k or lower
- *TR 7/8/9/10/11/12*—MTP, MT1, MT2, LIV or LV2, and a sample rate of 64k or higher
- *TR 3/4/5/6/7/8*—M24, M16 or CDR, and a sample rate of 64k or higher

VS-2400CD Tick Resolution Table

Use this table to convert beats to ticks when using the Measures and Beats counter.

Traditional Name:	*Length of Note:*	*Number of Ticks:*
Whole Note	One Whole Bar	1920
Half Note	Half of a Bar	960
Half Note Triplet	Third of a Bar	640
Quarter Note	Quarter of a Bar	480
Quarter Note Triplet	Sixth of a Bar	320
Eighth Note	Eight of a Bar	240
Eighth Note Triplet	Twelfth of a Bar	160
Sixteenth Note	Sixteenth of a Bar	120
Sixteenth Note Triplet	24th of a Bar	80
32nd Note	32nd of a Bar	60
32nd Note Triplet	48th of a Bar	40
64th Note	64th of a Bar	30
64th Note Triplet	96th of a Bar	20

MIDI Channels and Control Change Maps

Channels and Master Edit Area MIDI Channels

MIDI Channel	*Input Channel*	*Track Channel*	*FX Return Channels*
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	
6	6	6	
7	7	7	
8	8	8	
9	9	9/17	
10	10	10/18	
11	11	11/19	
12	12	12/20	
13	13	13/21	*Master Edit Area*
14	14	14/22	Direct paths
15	15	15/23	Aux busses
16	16	16/24	MASTER/MONITOR

Control Change Numbers—Input Channel Parameters

Input Channels 1-16

Control Change	*Parameter*
7	Fader Level
10	Pan
12	Aux 1 Send Level
13	Aux 2 Send Level
14	Aux 3 Send Level
15	Aux 4 Send Level
16	Aux 5 Send Level
17	Aux 6 Send Level
18	Aux 7 Send Level
19	Aux 8 Send Level
20	Aux 1/2 Send Pan
21	Aux 3/4 Send Pan
22	Aux 5/6 Send Pan
23	Aux 7/8 Send Pan
24	Offset Fader Level
25	Offset Pan

Control Change Numbers—Track Channel Parameters

Track Channels 1-16		Track Channels 17-24	
Control Change	*Parameter*	*Control Change*	*Parameter*
35	TRACK STATUS	67	TRACK STATUS
39	Fader Level	71	Fader Level
42	Pan	74	Pan
44	Aux 1 Send Level	76	Aux 1 Send Level
45	Aux 2 Send Level	77	Aux 2 Send Level
46	Aux 3 Send Level	78	Aux 3 Send Level
47	Aux 4 Send Level	79	Aux 4 Send Level
48	Aux 5 Send Level	80	Aux 5 Send Level
49	Aux 6 Send Level	81	Aux 6 Send Level
50	Aux 7 Send Level	82	Aux 7 Send Level
51	Aux 8 Send Level	83	Aux 8 Send Level
52	Aux 1/2 Send Pan	84	Aux 1/2 Send Pan
53	Aux 3/4 Send Pan	85	Aux 3/4 Send Pan
54	Aux 5/6 Send Pan	86	Aux 5/6 Send Pan
55	Aux 7/8 Send Pan	87	Aux 7/8 Send Pan
56	Offset Fader Level	88	Offset Fader Level
57	Offset Pan	89	Offset Pan

TRACK STATUS Buttons—The Effects of Control Change Values

You can change the current setting of a TRACK STATUS button by sending Control Change messages to the VS-2400CD. Tracks 1-16 respond to Control Change 35. Tracks 17-24 respond to Control Change 67. The following table shows how a TRACK STATUS button's setting changes in response to various received Control Change values.

	Values from 0-41	*Values from 42-83*	*Values from 84-127*
With the	Off → *same*	Off → Record-ready	Off → Play
VS-2400CD	Play → Off	Play → Record-ready	Play → *same*
stopped	Record-ready → Off	Record-ready → *same*	Record-ready → Play

X=ignored	*Values from 0-41*	*Values from 42-83*	*Values from 84-127*
During	Off→ *X*	Off → *X*	Off → Play
playback &	Play → Off	Play → *X*	Play → *X*
recording	Record → *X*	Record → *X*	Record → *X*

Control Change Numbers—FX Return Channel 1-4 Parameters

Control Change	*Parameter*	*Control Change*	*Parameter*
102	Fader Level	109	Aux 6 Send Level
103	Balance	110	Aux 7 Send Level
104	Aux 1 Send Level	111	Aux 8 Send Level
105	Aux 2 Send Level	112	Aux 1/2 Send Pan
106	Aux 3 Send Level	113	Aux 3/4 Send Pan
107	Aux 4 Send Level	114	Aux 5/6 Send Pan
108	Aux 5 Send Level	115	Aux 7/8 Send Pan

Control Change Numbers—Master Edit Parameters

MIDI Channel 14		**MIDI Channel 15**	
Control Change	*Parameter*	*Control Change*	*Parameter*
102	Direct 1 Level	104	Aux 1 Level
103	Direct 2 Level	105	Aux 2 Level
104	Direct 3 Level	106	Aux 3 Level
105	Direct 4 Level	107	Aux 4 Level
106	Direct 5 Level	108	Aux 5 Level
107	Direct 6 Level	109	Aux 6 Level
108	Direct 7 Level	110	Aux 7 Level
109	Direct 8 Level	111	Aux 8 Level
110	Direct 1/2 Balance	112	Aux 1/2 Balance
111	Direct 3/4 Balance	113	Aux 3/4 Balance
112	Direct 5/6 Balance	114	Aux 5/6 Balance
113	Direct 7/8 Balance	115	Aux 7/8 Balance
		MIDI Channel 16	
		102	MASTER Level
		103	MASTER Balance
		104	MONITOR Balance

V-Fader Control Messages

The V-Fader feature—Page 286—allows you to send the following Control Change messages from the VS-2400CD's faders.

Control Change:	*Range:*	*Control Change:*	*Range:*
CC 0 (BankSelMSB)	0-127	CC66 (Sostenuto)	0-127
CC1 (Modulation)	0-127	CC67 (Soft)	0-127
CC2 (Breath)	0-127	CC68	0-127
CC3	—	CC69 (Hold 2)	0-127
CC4 (Foot)	0-127	CC70	0-127
CC5 (Porta Time)	0-127	:	:
CC6 (DataEntryMSB)	0-127	CC83	0-127
CC7 (Volume)	0-127	CC84 (Porta Ctrl)	0-127
CC8 (Balance)	0-127	CC85	0-127
CC9	—	:	:
CC10 (Pan)	0-127	CC90	0-127
CC11 (Expression)	0-127	CC91 (Reverb Send)	0-127
CC12	0-127	CC92 (EFFECT 2)	0-127
:	:	CC93 (Chorus Send)	0-127
CC31	0-127	CC94 (EFFECT 4)	0-127
CC32 (BankSelLSB)	0-127	CC95	0-127
CC33	0-127	:	0-127
:	:	CC97	0-127
CC37	0-127	CC98 (NRPN LSB)	0-127
CC38 (DataEntryLSB)	0-127	CC99 (NRPN MSB)	0-127
CC39	0-127	CC100 (RPN LSB)	0-127
:	:	CC101 (RPN MSB)	0-127
CC63	0-127	:	:
CC64 (Hold 1)	0-127	CC119	0-127
CC65 (Portamento)	0-127		

Automix Parameter List

The VS-2400CD's Automix feature can record and playback changes to the values of the following parameters.

Input and track channel parameters

Automix name:	*Description:*	*Automix name:*	*Description:*
LEVEL(Fader)	*Mix Send Level*	AUX7/8SendPAN	*AUX7/8 Send Pan *6*
PAN	*Mix Send Pan*	Surnd PAN	*Surround Pan*
OFFSET LEVEL	*Offset Level *1*	Surnd DEPTH	*Surround Depth*
OFFSET PAN	*Offset Pan *2*	Surnd LR:C	*Surround LR:C Ratio*
MUTE	*Mute*	Surnd SubWLev	*Surround Sub Woofer Level*
AUX1 Send Sw	*AUX1 Send Switch*	EQ Sw	*EQ Switch*
AUX2 Send Sw	*AUX2 Send Switch*	EQ Low Gain	*EQ Low Gain*
AUX3 Send Sw	*AUX3 Send Switch*	EQ Low Freq	*EQ Low Frequency*
AUX4 Send Sw	*AUX4 Send Switch*	EQ LoMid Gain	*EQ Low Mid Gain*
AUX5 Send Sw	*AUX5 Send Switch*	EQ LoMid Freq	*EQ Low Mid Frequency*
AUX6 Send Sw	*AUX6 Send Switch*	EQ LoMid Q	*EQ Low Mid Q*
AUX7 Send Sw	*AUX7 Send Switch*	EQ HiMid Gain	*EQ High Mid Gain*
AUX8 Send Sw	*AUX8 Send Switch*	EQ HiMid Freq	*EQ High Mid Frequency*
AUX1 Send Lev	*AUX1 Send Level*	EQ HiMid Q	*EQ High Mid Q*
AUX2 Send Lev	*AUX2 Send Level*	EQ High Gain	*EQ High Gain*
AUX3 Send Lev	*AUX3 Send Level*	EQ High Freq	*EQ High Frequency*
AUX4 Send Lev	*AUX4 Send Level*	InsFX1 SndLev	*Insert Effect 1 Send Level*
AUX5 Send Lev	*AUX5 Send Level*	InsFX2 SndLev	*Insert Effect 2 Send Level*
AUX6 Send Lev	*AUX6 Send Level*	InsFX3 SndLev	*Insert Effect 3 Send Level*
AUX7 Send Lev	*AUX7 Send Level*	InsFX4 SndLev	*Insert Effect 4 Send Level*
AUX8 Send Lev	*AUX8 Send Level*	InsFX1 RtnLev	*Insert Effect 1 Return Level*
AUX1/2SendPAN	*AUX1/2 Send Pan *3*	InsFX2 RtnLev	*Insert Effect 2 Return Level*
AUX3/4SendPAN	*AUX3/4 Send Pan *4*	InsFX3 RtnLev	*Insert Effect 3 Return Level*
AUX5/6SendPAN	*AUX5/6 Send Pan *5*	InsFX4 RtnLev	*Insert Effect 4 Return Level*

**1 When ChLink or FLink is on.*

**2 When ChLink is on*

**3 When Aux Busses 1 and 2 are linked.*

**4 When Aux Busses 3 and 4 are linked.*

**5 When Aux Busses 5 and 6 are linked.*

**6 When Aux Busses 7 and 8 are linked.*

FX return channel parameters

Automix name:	*Description:*	*Automix name:*	*Description:*
LEVEL (Fader)	*Effect Return Level*	AUX2 Send Lev	*AUX2 Send Level*
BALANCE	*Effect Return Balance*	AUX3 Send Lev	*AUX3 Send Level*
MUTE	*Mute*	AUX4 Send Lev	*AUX4 Send Level*
AUX1 Send Sw	*AUX1 Send Switch*	AUX5 Send Lev	*AUX5 Send Level*
AUX2 Send Sw	*AUX2 Send Switch*	AUX6 Send Lev	*AUX6 Send Level*
AUX3 Send Sw	*AUX3 Send Switch*	AUX7 Send Lev	*AUX7 Send Level*
AUX4 Send Sw	*AUX4 Send Switch*	AUX8 Send Lev	*AUX8 Send Level*
AUX5 Send Sw	*AUX5 Send Switch*	Surnd PAN	*Surround Level*
AUX6 Send Sw	*AUX6 Send Switch*	Surnd DEPTH	*Surround Depth*
AUX7 Send Sw	*AUX7 Send Switch*	Surnd LR:C	*Surround LR:C Ratio*
AUX8 Send Sw	*AUX8 Send Switch*	Surnd SubWLev	*Surround Sub Woofer Level*
AUX1 Send Lev	*AUX1 Send Level*		

Master Edit

Automix name:	*Description:*	*Automix name:*	*Description:*
LEVEL	*Master Level*	Balance	*Master Balance*

Aux bus parameters

Automix name:	*Description:*	*Automix name:*	*Description:*
LEVEL	*AUX Master Level*	POSITION	*AUX Position*
BALANCE	*AUX Master Balance*		

Direct path parameters

Automix name:	*Description:*	*Automix name:*	*Description:*
LEVEL	*DIR Master Level*	POSITION	*DIR Position*
BALANCE	*DIR Master Balance*		

Effect 1-4 parameters

Automix name:	*Description:*
PATCH	*Effect Patch Number*

V-LINK parameters

Automix name:	*Description:*	*Automix name:*	*Description:*
BANK	*Clip Bank Select*	COLOR Cb	*Color Cb Control*
CLIP	*Clip Select*	DISSOLVE	*Dissolve time*
BRIGHTNESS	*Brightness Control*	PLAY SPEED	*Play Speed*
COLOR Cr	*Color Cr Control*	<ALL>	*Play All Clips in Bank*

V-Studio Song/VS-2400CD Project Compatibility

All VS-2480/VS-2480CD project parameters are preserved when a VS-2480/VS-2480CD project is imported into a VS-2400CD, with the exception of settings for the VS-2480 Inputs 17-24 and Effects 5-8, which are discarded in the resulting VS-2400CD project.

Recording Mode Tables

A project using the following recording modes can be converted into a VS-2400CD project using the project IMPORT operation.

Recording mode:	*VS-1880:*	*VS-1680:*	*VS-890/VSR880:*	*VS-880EX:*	*VS-880:*
MTP	OK	OK	VSR*	—	—
CDR	OK	—	OK	—	—
M16 (MAS)	OK	OK	OK	OK	OK
MT1	OK	OK	OK	OK	OK
MT2	OK	OK	OK	OK	OK
LIV	OK	OK	OK	OK	OK
LV2	OK	OK	—	—	—

**Imported VSR-mode songs are converted to MTP mode.*

A project using the following recording modes can be exported as an earlier V-Studio song using the project EXPORT operation.

Recording mode:	*VS-1880:*	*VS-1680:*	*VS-890/VSR880:*	*VS-880EX:*	*VS-880:*
M24	—	—	—	—	—
MTP	OK	OK	VSR*	—	—
CDR	OK	—	OK	—	—
M16 (MAS)	OK	OK	OK	OK	OK
MT1	OK	OK	OK	OK	OK
MT2	OK	OK	OK	OK	OK
LIV	OK	OK	OK	OK	OK
LV2	OK	OK	—	—	—

**Exported MTP-mode songs are converted to VSR mode.*

Parameter Translations

Level Values

When an earlier V-Studio's song is imported, and when a VS-2400CD project is exported, level values are translated as follows.

Earlier V-Studio:	*VS-2400CD:*
0	-∞dB
100	0dB
127	+6dB

Busses

When importing earlier V-Studio songs into the VS-2400CD, busses are re-assigned as follows.

VS-880:	*VS-880EX/890, VSR-880:*	*VS-1680/1880:*	*VS-2400CD*
AUX A/B	AUX1 L/R	FX1 L/R	AUX 1/2
FX1 A/B	AUX2 L/R (FX1 L/R)	FX2 L/R	AUX 3/4
FX2 A/B	AUX3 L/R (FX2 L/R)	AUX1 L/R (FX3 L/R)	AUX 5/6
—	—	AUX2 L/R (FX4 L/R)	AUX 7/8
—	—	AUX3 L/R (AUX L/R)	DIR 1/2

EQ

When importing earlier V-Studio songs into the VS-2400CD, EQ parameters are re-mapped as follows.

VS-880/880EX/890, VSR-880:	*VS-1680/1880:*	*VS-2400CD:*
EQL	EQ Low	Lo
EQM	EQ Mid	Lo-Mid
EQH	EQ High	Hi

Effect Patches

This table notes the existence of certain VS-2400CD effect patches in earlier V-Studios.

VS-880:	*VS-880EX v. 1.x* VS-1680 v. 1.x*:*	*VS-880EX/890/1680/1880, VSR-890:*	*VS-2400CD:*
—	—	OK	Speaker Modeling
—	—	OK	Mastering Tool Kit
—	OK	OK	3Band Isolator
—	OK	OK	Tape Echo
—	OK	OK	Analog Flanger
—	OK	OK	Analog Phaser

** Speaker Modeling and the Mastering Tool Kit effects are available in the current VS-880EX and VS-1680 operating system versions. Visit* www.rolandus.com *or call Roland Product Support for more info.*

Attenuator

When an earlier V-Studio's song is imported, and when a VS-2400CD project is exported, attenuator values are translated as follows.

Earlier V-Studio:	*VS-2400CD:*	*Earlier V-Studio:*	*VS-2400CD:*
-42dB	-42.0 to -39.1dB	-12dB	-15.0 to -9.1dB
-36dB	-39.0 to -33.1dB	-6dB	-9.0 to -3.1dB
-30dB	-33.0 to -27.1dB	0dB	-3.0 to +2.9dB
-24dB	-27.0 to -21.1dB	+6dB	+3.0 to +6.0dB
-18dB	-21.0 to -15.1dB		

Glossary

Throughout the *VS-2400CD Owner's Manual*, we've noted terms that may be unfamiliar to beginners, using the symbol to the left. This glossary provides basic definitions for these terms. You'll find a second glossary in the *VS-2400CD Appendices* with definitions for additional terms with which you may not be familiar.

24-bit

The VS-2400CD captures and plays audio digitally as 24-bit data. 24-bit recording is the current industry standard for pro-quality digital audio. See "Bit depth."

Analog audio

Analog audio is a type of electrical signal in which sound is represented by varying amounts of voltage. Cassettes and vinyl records contain analog audio. Analog audio signals are converted back into sound by speakers.

ASCII

Short for "American Standard Code for Information Exchange." A universally recognized standard for representing characters, numbers and symbols. Most computer keyboards are ASCII keyboards.

Audio

A technical word for "sound."

Automix

Automix is the VS-2400CD's automated mixing system. It records and plays back changes you make to the VS-2400CD's mixer settings. See Chapter 25.

Auto Punch

The VS-2400CD's Auto Punch feature automatically starts and stops recording for you when you're punching, by storing your punch-in and -out points. See "Punching."

Aux bus

An Aux bus—short for "Auxiliary bus"—is a pathway that can carry multiple signals to a destination. In the VS-2400CD, an Aux bus is used most often as the pathway input and track channel signals travel to get to the VS-2400CD's internal effects. The VS-2400CD's eight Aux busses can also carry signals to outputs on their way to external devices such as headphone amplifiers and external effect processors.

Back up

To "back up" is to make a copy of project data and to store the copy on an external medium—such as a CD-R or CD-RW disk—for safekeeping. This copy is called a "backup." Backing up is extremely important to safeguard against unexpected events. To play or work on a project that's been backed up, it must be "recovered" by the VS-2400CD.

Balanced

Balanced cables and connectors produce low-noise signals by using all three of the cable's wires. In a balanced connection, two copies of the signal travel through the cable—one copy is 180 degrees out of phase. If the two signals have picked up any noise along the way, the noise is eliminated due to phase cancellation when the out-phase-signal is flipped back into phase at the destination connector. The third wire is the ground. Use balanced cables and connectors if possible. See "Phase cancellation."

Bit depth

Digital recording can capture audio using number strings of varying lengths—a longer string allows more detail in the description of level changes in the signal. The size of a string is referred to as its "bit depth." Most often, digital devices record and play audio using bit depths of 16 or 24 bits. Audio CDs use 16 bits.

Bouncing

Bouncing is the copying of tracks onto other tracks. Typically, this is done to combine a greater number of tracks into a fewer tracks, though there are other reasons to bounce. Some people call bouncing "ping-ponging."

Burn

"Burn" is music industry slang for writing data onto a CD.

Bus

A bus is a pathway down which one or more signals travel to a common destination.

CD-R/RW drive

A CD-R/RW drive—short for "CD-Recordable/ReWritable"—is a device that can burn audio onto CD-R ("CD-Recordable") or CD-RW ("CD-ReWritable") discs. You can write unerasable, permanent data onto a CD-R one time. A CD-RW disk can be reused: You can erase a CD-RW and write new data onto the disk.

Channel

A channel is a set of tools for managing and shaping an audio signal. The VS-2400CD has input channels, track channels, Aux master channels and FX return channels.

Channel strip

A channel strip is a physical set of channel controls. In the VS-2400CD, there are 16 channel strips that can be assigned to the control of the various channels (see "Channels" above).

Compressor

A device that can reduce the level of signals that are louder than a specified volume.

dB, dBu

Units of measurement for the levels of audio signals.

Dither

Dither is a process that deliberately adds a tiny amount of noise to a signal in order to mask unwanted sounds that can be introduced when the signal's original bit depth is reduced. Dithering is recommended when transferring audio to an external device that uses a lower bit depth. See "Bit depth."

Dry

A signal to which no effect processing has been applied.

Digital audio

A form of computer-based data that represents audio as strings of binary numbers—that is, digits. When audio is captured by a digital recorder, it's converted into numbers. Digital audio sounds great and can be subjected to a wide array of processes without any unwanted degradation to its quality.

EQ

Abbreviation for "equalization."

Equalization

The process of adjusting the volumes of individual sound waves within an audio signal in order to shape the signal's overall character. Bass and treble controls on a stereo system are equalizers.

Fader

The handle in each channel strip that you can slide forward or back to raise or lower, respectively, the corresponding signal's level—the fader is a channel's volume control. On the VS-2400CD, you can also raise or lower parameter values using its faders.

Frame

In SMPTE and MTC time codes, seconds are divided into frames as determined by the current frame rate.

GPI

GPI is short for "General Purpose Interface," a control jack found on some video editing devices. By connecting this jack to the VS-2400CD's FOOT SWITCH jack, you can stop and start VS-2400CD project playback remotely from the video device.

Hard drive

A device that stores data on one or more rigid platters mounted inside its case. The VS-2400CD's hard drive stores all of your project data, including its audio.

High impedance

Impedance is the amount of force with which analog audio voltages are sent into jacks or accepted by jacks. High-impedance devices include electric guitars and basses, and some semi-pro microphones. Connect high-impedance devices to the VS-2400CD's GUITAR HI-Z (for "High Impedance") jack.

IDE

Short for "Integrated Device and Electronics." A set of data transmission standards employed by high-speed disk drives. The VS-2400CD has an internal IDE hard drive.

Limiter

A limiter is a compressor with a ratio setting of 10:1 or greater. This has the effect of preventing all but the fastest signals from exceeding the threshold volume, forcing them into the desired level range.

Line level

The high-level signal produced at the outputs of synths, samplers, beat boxes, turntable preamps, CD players, multitrack recorders, cassette decks and so on.

Locator

A bookmark for a time location within a project. Locators are fast and easy to recall, and are ideal for navigating a project, which can have up to 100 locators.

Loop

As a verb, the act of playing the same project section over and over until STOP is pressed. As a noun, the section of the project that's played when the VS-2400CD's Loop feature is turned on.

Low Impedance

Impedance is the amount of force with which analog audio voltages are sent into jacks or accepted by jacks. Low-impedance devices include pro-quality mics, as well as synths, samplers, beat boxes, effect processors and so on. Connect low-impedance devices to the VS-2400CD's XLR or 1/4" TRS jacks.

Marker

A bookmark for a specific time location within a project. You can have up to 1,000 markers in a project. Markers are best used for events within a project that you want to pinpoint, but that you won't often need to return to.

Mastering

The final step in the process of preparing your project mix for publication and/or mass-duplication.

Mastering tracks

The pair of V-Tracks belonging to Tracks 23 and 24 onto which a project's final mix is recorded. Mastering tracks can be burned onto an audio CD. See "V-Tracks."

Mic level

The low-level signal produced by microphones and electric instruments such as electric guitar or bass.

MIDI

For "Musical Instrument Digital Interface," the wiring and message protocol that allows the VS-2400CD and other MIDI devices to communicate by exchanging instructions called "MIDI messages."

MIDI control surface

A hardware device that transmits MIDI messages, and whose purpose is the control of a second MIDI device.

MIDI Control Change messages

A type of MIDI message that's permanently assigned to a particular parameter. When you send a MIDI Control Change value, it sets the value of the parameter in the MIDI device that receives it.

MMC

Short for "MIDI Machine Control." MMC messages are a type of MIDI message that communicates button-press instructions—PLAY, STOP, etc.—between MIDI devices.

MTC

For "MIDI Time Code," a form of SMPTE time code that travels between MIDI devices through MIDI cables.

Panning

Panning controls how much of a signal is sent to the left and/or right speaker in a stereo system, creating the illusion that the sound is occurring at a physical location between the two speakers.

Phase Cancellation

Each sound wave is a series changes in air pressure that your ears interpret as sound. It's possible to have two identical or very similar sound waves that conflict: at the exact moment when one is increasing air pressure, the other is lowering it. The result is that the two sound waves cancel each other out, and neither is heard. This is called "phase cancellation." The problem can be solved by turning the air pressure changes of one of the signals upside down so that both soundwaves agree—this is referred to as "inverting," or "flipping," the signal's "phase."

Phrase

A phrase is a set of pointers that instructs the VS-2400CD when and how to play a take—an audio file—stored on its hard drive. See "Take."

Playlist

A list of all of the data to be played in a project, arranged along a horizontal, left-to-right axis. On the Home screen, a playlist presents the project's phrases. On the AUTOMIX EDIT screen, Automix data is listed.

Project

All of the audio and settings for a recorded work in the VS-2400CD, stored as a project disk file on the VS-2400CD's hard drive.

PS/2

PS/2 is a wiring standard for computer peripheral devices developed by IBM.

Punch

The process of re-recording sections of a previously recorded track. The act of starting a punch is called "punching in." Ending a punch is called "punching out."

Realtime

A realtime process is one that occurs while you're recording or playing back a project without requiring you to stop either action, since it takes place in "real time."

Redo

You can reverse an undo by performing a "redo." See "Undo."

Region

A region is a section of time within a project, defined by the placement of IN and OUT edit points—it's the portion of the project that falls between these two edit points.

Recover

To reload a project you've backed up, use the project RECOVER operation. When you recover backup data, the VS-2400CD re-converts it back to its original form.

Routing

The connection of a component's output to the input of another component. For example, you can route input jacks to input channels, input channels to tracks, Aux busses to effects or to output jacks, and so on.

Sample rate

Digital audio recorders don't actually capture sound continually—they sample the sound many, many times per second. When the samples are played back, the ear perceives what it's hearing as continuous audio. The number of times per second that a digital recorder samples its audio is referred to as its "sample rate." CDs use a 44.1kHz sample rate—44,100 samples per second. The VS-2400CD can record at various sample rates.

Scene

A scene is an object that stores all of the mixer's current settings. Each project can hold 100 scenes. You can instantly recall a scene to restore the settings it contains.

Slave

One device controls the timing of synchronized devices. That device is the master. Any device controlled by the master is a slave device.

Signal flow

The journey a signal takes from one place to another, including all of the components it passes through along the way.

SMPTE

Short for "Society of Motion Picture and Television Engineers." SMPTE is a form of time code data that's sent from a master device to a slave device(s)—see "Slave" above. It allows you to synchronize the VS-2400CD's hard disk recorder with external devices.

Snapshot

An Automix object that stores the values of all automatable parameters at a particular moment in a project. When the project is played, Automix re-installs the parameters' values when the now line reaches the location at which the snapshot was taken.

Song Position Pointer (SPP)

A type of MIDI message that communicates song/sequence/project location information by transmitting the number of 16th notes since the beginning of the song/sequence/project.

Subframe

A subdivision of a SMPTE or MTC frame equaling 1/98th of a frame.

Synchronization

The process of coordinating the timing of two devices.

Take

In the VS-2400CD, a take is an audio file recorded on your hard drive. In general studio usage, "take" refers to an attempt to record a performance, successful or otherwise.

Tick

One 480th of a quarter note at the current project tempo.

Now line

The dark vertical line at the center of a playlist that represents your current position in the playlist. Also called a "now line."

TRS

Short for "Tip/Ring/Sleeve." A type of 1/4" audio cable connector that uses three wires for carrying audio signals and for grounding. The wires are attached to the connector's tip, ring and a second ring called a "sleeve."

Track

In the VS-2400CD's hard disk recorder, a track is a collection of 16 V-Tracks, any one of which can be active at a time. With the Automix feature, a track is a string of parameter values for a mixer channel or bus recorded as Automix data. See "V-Track."

Unbalanced

A type of audio cable and connector that uses two wires, one for the audio and one for the ground—a third wire isn't used.

Undo

The VS-2400CD's Undo feature allows you to reverse up to 99 of your most recent recording and editing actions in a project. The act of reversing an action is referred to as "undoing" the action.

V-Track

A V-Track ("Virtual Track") is a string of phrases arranged one after another in the order in which they're to be played back by the VS-2400CD's hard disk recorder. Each VS-2400CD track contains 16 V-Tracks, any one of which can be played back or recorded on at any given time.

Virtual Track

See "V-Track."

Waveform

A waveform is an audio signal displayed in a grid. The horizontal axis shows elapsed time, and the vertical axis shows volume, or "amplitude."

Wet

A "wet" signal is a signal to which an effect has been applied.

Word clock

A type of timing information carried within a digital audio signal that keeps multiple digital recording devices precisely synchronized when exchanging digital audio.

XLR

Also called "Cannon connectors." XLR connectors are found on almost all studio-quality, low impedance microphones and other professional audio equipment. XLR connectors are male-type or female-type. XLR connections can carry phantom power to condenser mics that require it. XLR audio cables are typically balanced—see "Balanced."

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QATAR
Al Emadi Co. (Badie Studio & Stores)
P.O. Box 62,
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SAUDI ARABIA
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Corniche Road, Aldossary Bldg.,
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SAUDI ARABIA

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SYRIA
Technical Light & Sound Center
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TURKEY
Barkat muzik aletleri ithalat ve ihracat Ltd Sti
Siraselviler Caddesi Siraselviler
Pasaji No:74/20
Taksim - Istanbul, TURKEY
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U.A.E.
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TEL: (323) 890 3700

As of August 1, 2002 (Roland)

For EU Countries

Apparatus containing Lithium batteries

CAUTION

Danger of explosion if battery is incorrectly replaced.
Replace only with the same or equivalent type recommended by the manufacturer.
Discard used batteries according to the manufacturer’s instructions.

ADVARSEL!

Lithiumbatteri - Eksplosionsfare ved fejlagtig håndtering.
Udskiftning må kun ske med batteri af samme fabrikat og type.
Levér det brugte batteri tilbage til leverandøren.

VARNING

Explosionsfara vid felaktigt batteribyte.
Använd samma batterityp eller en ekvivalent typ som rekommenderas av apparattillverkaren.
Kassera använt batteri enligt fabrikantens instruktion.

ADVARSEL

Eksplosjonsfare ved feilaktig skifte av batteri.
Benytt samme batteritype eller en tilsvarende type anbefalt av apparatfabrikanten.
Brukte batterier kasseres i henhold til fabrikantens instruks joner.

VAROITUS

Paristo voi räjähtää, jos se on virheellisesti asennettu.
Vaihda paristo ainoastaan laitevalmistajan suosittelemaan tyyppiin. Hävitä käytetty paristo valmistajan ohjeiden mukaisesti.

For EU Countries

This product complies with the requirements of European Directives EMC 89/336/EEC and LVD 73/23/EEC.

For the USA

FEDERAL COMMUNICATIONS COMMISSION RADIO FREQUENCY INTERFERENCE STATEMENT

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Unauthorized changes or modification to this system can void the users authority to operate this equipment.
This equipment requires shielded interface cables in order to meet FCC class B Limit.

For Canada

NOTICE

This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

AVIS

Cet appareil numérique de la classe B respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

Copyright

- Unauthorized recording, distribution, sale, lending, public performance, broadcasting, or the like, in whole or in part, of work (musical composition, video, broadcast, public performance, or the like) whose copyright is held by a third party is prohibited by law.
- When exchanging audio signals through a digital connection with an external instrument, this unit can perform recording without being subject to the restrictions of the Serial Copy Management System (SCMS). This is because the unit is intended solely for musical production, and is designed not to be subject to restrictions as long as it is used to record works (such as your own compositions) that do not infringe on the copyrights of others. (SCMS is a feature that prohibits second-generation and later copying through a digital connection. It is built into MD recorders and other consumer digital-audio equipment as a copyright-protection feature.)
- Do not use this unit for purposes that could infringe on a copyright held by a third party. Roland assumes no responsibility whatsoever with regard to any infringements of third-party copyrights arising through your use of this unit.

About the License Agreement

The VS-2400CD and its CD-R/RW capability are designed to allow you to reproduce material to which you have copyright, or material which the copyrighted material without permission of the copyright owner avoiding technical prohibiting features of second-generation and later copying like SCMS or others constitutes copyright infringement and may incur penalties even in case such reproduction is for your own personal use and enjoyment (private use). Consult a copyright specialist or special publications for more detailed information on obtaining such permission from copyright holders.

Disclaimer of liability

Roland will take no responsibility for any "direct damages," "consequential damages," or "any other damages" which may result from your use of the VS-2400CD. These damages may include but are not limited to the following events which can occur when using the VS-2400CD.

- Any loss of profit that may occur to you
- Permanent loss of your music or data
- Inability to continue using the VS-2400CD itself or a connected device

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